بِسۡمِ اللّٰہِ الرَّحۡمٰنِ الرَّحِیۡمِ

(In the Name of Allah, the Most Compassionate, the Most Merciful.)

# Mathematics

# Grade 4

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Unit 1

# Whole Numbers

## Learning Outcomes

**After completing this section, you will be able to:**

- Identify place values of digits up to one hundred thousand (100 000).
- Read numbers up to one hundred thousand (100 000).
- Write numbers up to one hundred thousand (100 000).
- Write numbers in words up to one hundred thousand (100 000).
- Compare and order numbers up to 5-digit.

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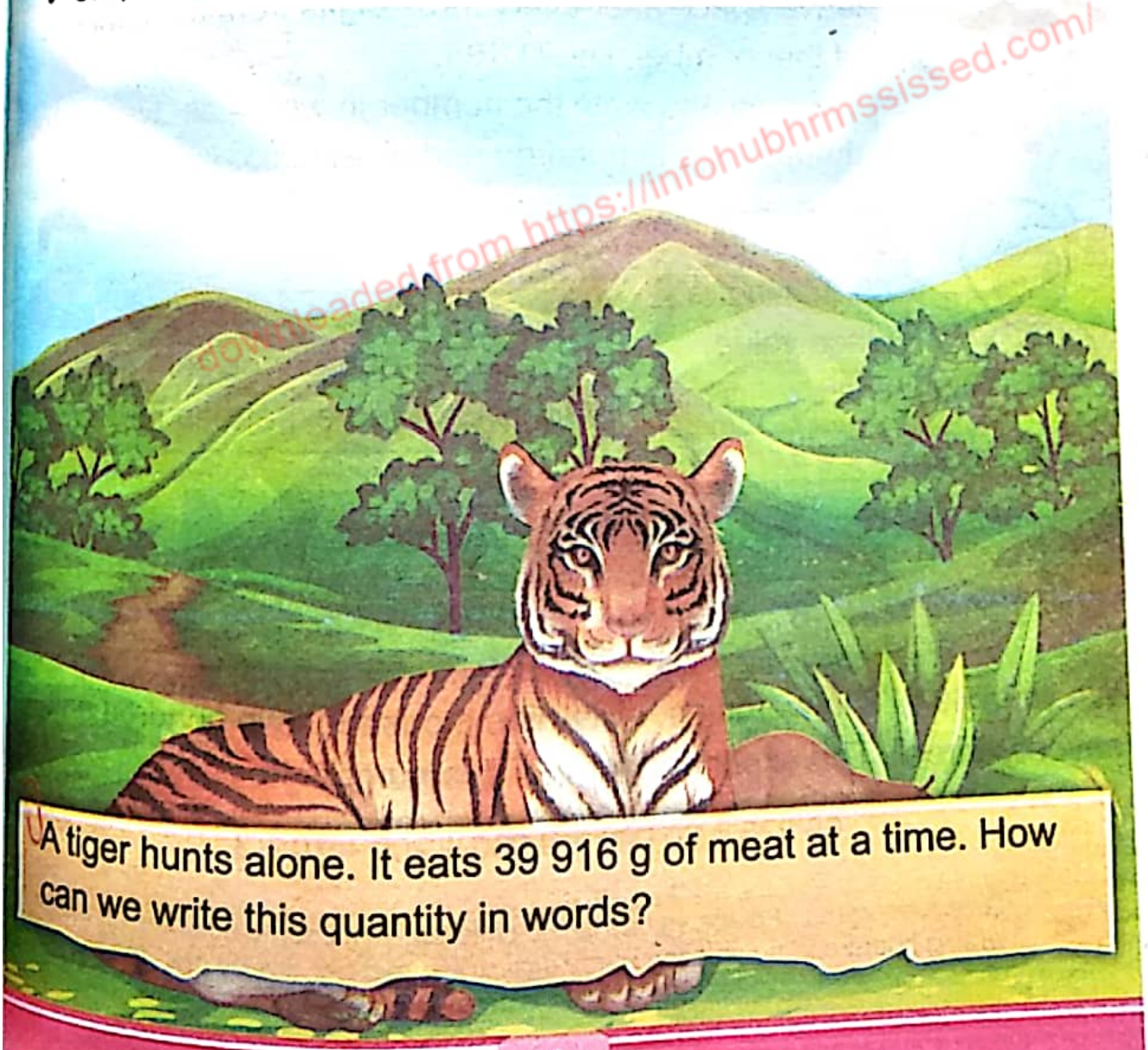

A tiger hunts alone. It eats 39 916 g of meat at a time. How can we write this quantity in words?



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# Numbers up to One Hundred Thousand

The length of the great wall of China is 21 196 km. How can we read and write 21 196 in words?

The number which is greater than three digits, we leave space after every three digits from the right side of that number, i.e. 21 196.
We read and write the number in words as "twenty-one thousand, one hundred and ninety-six".

Let us write 69 273 in the place value chart.

**Key Fact**

To write the number as sum of place values is called expanded form.

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 6 | 9 | 2 | 7 | 3 |

We write 69 273 in words as "sixty-nine thousand, two hundred and seventy-three". The expanded form of this number is:

$$69\,273 = 60\,000 + 9\,000 + 200 + 70 + 3$$

Give flash cards of place values to the children. Write some numbers on the writing board and by pointing every digit of the number one by one, ask the children to show correct place value card of that digit.



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**Try Yourself**

Find the place and place value of 2 in 2 918. Also write this number in words.

Now, we write place and place value of every digit in 69 273.

6 is at the ten thousands place and its place value = 6 × 10 000 = 60 000

9 is at the thousands place and its place value = 9 × 1 000 = 9 000

2 is at the hundreds place and its place value = 2 × 100 = 200

7 is at the tens place and its place value = 7 × 10 = 70

3 is at the ones place and its place value = 3 × 1 = 3

The cost of a laptop is Rs 78 500. Let's write the place and place value of digits 78 500. Also write it in expanded form and words.

7 is at the ten thousands place and its place value = 7 × 10 000 = 70 000

8 is at the thousands place and its place value = 8 × 1 000 = 8 000

5 is at the hundreds place and its place value = 5 × 100 = 500

0 is at the tens place and its place value = 0 × 10 = 00

0 is at the ones place and its place value = 0 × 1 = 0

In expanded form: 70 000 + 8 000 + 500 + 00 + 0

In words: Seventy-eight thousand and five hundred.

Ask the children to write one 5-digit number in the notebook. Then instruct them to write this number in words and write the place and place value of each digit of that number.



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99 999 is the greatest 5-digit whole number. If we add 1 to it, we get one hundred thousand that is the smallest 6-digit whole number.

**Try Yourself**

How many ten thousands are there in one hundred thousand?

$$\begin{array}{r} 99,999 \\ +\quad\quad 1 \\ \hline 100,000 \end{array}$$

We write these numbers in the place value chart as:

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | 9 | 9 | 9 | 9 | 9 |
| 1 | 0 | 0 | 0 | 0 | 0 |

**Try Yourself**

Can you tell what is the smallest and the greatest 5-digit whole numbers?

**Try It!** Challenge

By using the given digits:

- Make a greatest 5-digit number and write it in words.
- Make the smallest 5-digit number and write the place value of each digit of that number.
- Write 3-different numbers whose digit at thousands place is 3.
- Make a 5-digit whole number whose sum of digits of ten thousands place and tens place is 8 and the difference is 2.
- Write such a whole number in which no digit is repeated.

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## Exercise 1

1. Write the following numbers in the expanded form:

(a) 75 432 (b) 37 911 (c) 10 956 (d) 46 743
(e) 86 594 (f) 09 223 (g) 22 167 (h) 57 890
(i) 36 789 (j) 78 324 (k) 41 452 (l) 56 432

2. Write the following numbers in standard form:

(a) 20 000 + 1 000 + 100 + 70 + 1 = _____
(b) 30 000 + 9 000 + 200 + 30 + 5 = _____
(c) 60 000 + 5 000 + 300 + 40 + 3 = _____
(d) 50 000 + 6 000 + 700 + 90 + 0 = _____

3. Write the place and place value of the coloured digits.

(a) 76 102 (b) 24 360 (c) 94 615 (d) 65 496
(e) 73 456 (f) 18 654 (g) 34 566 (h) 86 042
(i) 56 324

4. Write the following numbers in words:

(a) 74 325 (b) 43 711 (c) 19 560 (d) 75 434
(e) 67 459 (f) 25 302 (g) 36 721 (h) 78 065
(i) 62 897 (j) 37 264 (k) 45 129 (l) 43 275

5. Write the following in numerals:

(a) Twenty-five thousand, six hundred
(b) Seventy-eight thousand, four hundred and two
(c) Forty-one thousand, sixty-one
(d) Ninety-eight thousand, three hundred and one
(e) Seventy-two thousand, five hundred and forty-six
(f) Twelve thousand, five hundred and fifty-five
(g) Ninety-eight thousand, five
(h) Forty-eight thousand, four hundred and forty-four
(i) Eighty-eight thousand, three hundred and twenty

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# Comparing and Ordering Numbers

The diameter of Earth is 12 742 km. The diameter of Venus is 12 104 km. How can we compare the diameters of both planets?

We can compare the numbers easily with the help of place value of numbers.

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 1 | 2 | 7 | 4 | 2 |
| 1 | 2 | 1 | 0 | 4 |

**Try Yourself**

Compare 62 323 and 62 199, by using correct symbol.

(i) First compare the digit at the greatest place value. The digit of the numbers at ten thousands place is '1'.

(ii) The digits of both the numbers at thousands place is '2'.

(iii) At hundreds place digit '7' is greater than the digit '1'.

So, 12 742 is greater than 12 104 that is:

$$12\,742 > 121\,04$$

So, diameter of Earth is greater than Venus.

**Key Fact**

To compare numbers, compare digits from left to right until you find two different digits.



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Let's find out which number is smaller from the given numbers?
32 974 and 46 322

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 3 | 2 | 9 | 7 | 9 |
| 4 | 0 | 3 | 2 | 2 |

Here, the digit '3' at ten thousand place is smaller than the digit '4'.
So, 32 979 is smaller than 40 322 that is:

$32\,979 < 40\,322$

**Try Yourself**

Compare the greatest and the smallest 5-digit number.

**Try Yourself**

Compare 8 799 ; 22 234 and 22 229.

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The price of three mobile phone models are Rs 62 870, Rs 78 200 and Rs 75 110, respectively. Compare their prices and write it in ascending order.

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 6 | 2 | 8 | 7 | 0 |
| 7 | 8 | 2 | 0 | 0 |
| 7 | 5 | 1 | 1 | 0 |

(i) In 62 870, the digit at the ten thousand place is smaller than the remaining two numbers. Therefore, 62 870 is the smallest number.


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(ii) In 78 200 and 75 110, the digit at ten thousand place are equal. In their thousand place digit '8' is greater than '5'. Therefore, 78 200 is greater than 75 110.

(iii) Let's now write these numbers in ascending order.
Ascending order: 68 870 ; 75 100 ; 78 200

**Key Fact**

The arrangement of numbers from smallest to the greatest is called ascending order. The arrangement of numbers from the greatest to the smallest is called descending order.

**Try It!**

Make two 4-digit and three 5-digit numbers. In every number the digit at the thousand place is '5' and digit at ones place is '9'. Then compare these numbers and write in descending order.

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## Exercise 2

1. Compare the following numbers by using symbols (<,>, =):

(a) 84 325 _____ 93 417 (b) 4 853 _____ 19 314

(c) 56 708 _____ 32 156 (d) 23 612 _____ 23 612

(e) 65 356 _____ 65 358 (f) 74 932 _____ 74 542

(g) 68 709_____43 216 (h) 32 567 _____ 23 578

Call some students in front of the class and give them flash cards of different numbers. Now ask them to compare numbers and write in ascending and descending order.



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Write the following numbers in descending order:

(a) 83 401; 97 035; 12 337

(b) 18 017; 18 221; 13 411

(c) 42 734; 53 358; 48 176

(d) 36 121; 34 222; 37 923

(e) 16 483; 23 601; 36 243

(f) 12 683; 24 313; 24 391

(g) 32 531; 36 537; 28 540

(h) 98 754; 78 543; 89 654

Write the following numbers in ascending order:

(a) 40 131; 40 735; 31 273

(b) 30 817; 28 211; 43 181

(c) 70 442; 58 375; 84 176

(d) 67 319; 22 342; 97 323

(e) 83 624; 36 241; 63 283

(f) 48 326; 23 634; 43 124

(g) 59 312; 60 337; 24 085

(h) 89 675; 84 675; 89 546

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## I have learnt to:

- identify the place value of digits up to one hundred thousand.
- read the numbers up to one hundred thousand.
- write the numbers up to one hundred thousand.
- read and write the numbers in words up to one hundred thousand.
- compare and order numbers up to 5-digit.

**Vocabulary**

- Numbers
- Digit
- Place Value
- Compare
- Order
- Ascending
- Descending



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# Review Exercise

1. Tick (✓) the correct option.

(a) The smallest 6-digit number is _____.

(i) 111 111 (ii) 100 000 (iii) 101 010 (iv) 111 000

(b) Comparison of numbers always starts from the _____.

(i) right (ii) left (iii) last (iv) above

(c) In number 38 101, the place value of digit '8' is _____.

(i) 800 (ii) 8 (iii) 80 (iv) 8000

(d) The greatest 5-digit number is _____.

(i) 91 100 (ii) 90 101 (iii) 99 999 (iv) 90 000

(e) 34 011 is greater than _____.

(i) 34 010 (ii) 34 111 (iii) 34 210 (iv) 34 212

(f) 31 108 is smaller than _____.

(i) 31 106 (ii) 31 107 (iii) 30 100 (iv) 31 109

2. Write the following numbers in words:

(a) 43 567 (b) 97 741 (c) 52 016

(d) 46 743 (e) 58 649 (f) 95 202

(g) 10 007 (h) 86 950 (i) 60 000

(j) 60 032 (k) 52 901 (l) 36 427

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3. Write the following numbers in the expanded form:

| | | |
|---|---|---|
| a 53 672 | b 74 311 | c 25 609 |
| d 65 743 | e 78 945 | f 92 502 |
| g 16 272 | h 69 078 | i 27 869 |
| j 32 786 | k 41 902 | l 64 753 |

4. Write the following in numerals:

(a) Fifty-one thousand, five hundred and eighty-six
(b) Eighty-two thousand, four hundred and four
(c) Fifteen thousand, sixty hundred and sixty
(d) Twenty-one thousand, one hundred and five
(e) Twenty-three thousand, five hundred and six
(f) Ninety-six thousand, one hundred and twenty-five
(g) Sixty-seven thousand and three

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5. Write the place and place value of the coloured digits.

| | | |
|---|---|---|
| a 65 021 | b 24 360 | c 46 715 |
| d 60 704 | e 57 561 | f 26 514 |
| g 52 663 | h 34 540 | |


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6. Write the following in standard form:

(a) 40 000 + 4 000 + 600 + 80 + 3 = _____

(b) 90 000 + 0 000 + 000 + 50 + 4 = _____

(c) 20 000 + 9 000 + 100 + 00 + 4 = _____

(d) 10 000 + 6 000 + 700 + 80 + 5 = _____

7. Compare the following numbers by using symbols (<, >, =):

a
5 847_____31 341

b
34 875_____

c
50 678_____ 45 321

d
75 326_____

e
76 643_____76 643

f
37 256 _____

g
66 809_____24 351

h
32 674_____

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8. Write the following in descending order:

(a) 12 683; 14 601; 18 624

(b) 16 283; 26 133; 14 394

(c) 23 913; 30 536; 22 480

(d) 54 788; 54 786; 54 790

9. Write the following numbers in ascending order:

(a) 94 041; 84 405; 33 731

(b) 19 375; 12 921; 14 131

(c) 45 034; 37 358; 42 876

(d) 36 172; 35 242; 37 723



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# Addition and Subtraction

## Learning Outcomes

**After completing this section, you will be able to:**

- Add numbers up to 5-digit.
- Solve real life number stories involving addition of numbers upto 5-digit.
- Subtract numbers up to 5-digit.
- Solve real life situations involving subtraction of numbers up to 5-digit.

An aeroplane covers 11 270 km distance from Peshawar to Toronto. The same plane covers approximately 10 921 km distance from Toronto to Lahore. Find the total distance covered during these two flights.

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# Addition

In town 'A', total votes cast were 54 372. In town 'B' total votes cast were 25 617. Can we find how many votes were cast in both towns altogether?

To find total number of votes cast we add them.

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| Votes cast in town 'A' = | 5 | 4 | 3 | 7 | 2 |
| Votes cast in town 'B' = | + 2 | 5 | 6 | 1 | 7 |
| Total votes = | 7 | 9 | 9 | 8 | 9 |

So, total 79 989 votes were cast in both towns altogether.

A publishing house published 25 575 story books. Considering the popularity of the book, the second edition was also published. In the second edition, 42 195 books were published. Find the total number of books published in both editions.

**Try Yourself**

Add 51 292 and 32 602.

TEACHING POINT

Instruct the students to make two 5-digit numbers and ask them to add these numbers and tell the method of addition.



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Here, we add the number of books published to get the total quantity.

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| number of books published in st edition = | 2 | ①5 | 5 | ①7 | 5 |
| number of books published in second edition = | + 4 | 2 | 9 | 1 | 5 |
| Total quantity = | 6 | 8 | 4 | 9 | 0 |

So, total 68 490 number of books were published in both editions.

**Try Yourself**

Find the sum of the greatest 5-digit and smallest 4-digit whole numbers.

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**Try It!**

Complete the following addition table:

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | 5 | | | 3 | |
| + | | 2 | 9 | | 4 |
| | 7 | 9 | 4 | 1 | 8 |

With the help of different examples, explain the concept of addition also explain the rule of carrying during the process of addition .



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## Exercise 1

1. Solve the following:

(a)

| | T.th | Th | H | T | O |
|---|---|---|---|---|---|
| | 1 | 3 | 9 | 2 | 7 |
| + | | 2 | 4 | 1 | 5 |

(b)

| | T.th | Th | H | T | O |
|---|---|---|---|---|---|
| | 3 | 5 | 3 | 2 | 1 |
| + | | 4 | 6 | 4 | 9 |

(c)

| | T.th | Th | H | T | O |
|---|---|---|---|---|---|
| | 7 | 5 | 6 | 7 | 9 |
| + | 1 | 6 | 8 | 2 | 8 |

(d)

| | T.th | Th | H | T | O |
|---|---|---|---|---|---|
| | 3 | 5 | 3 | 1 | 2 |
| + | 2 | 4 | 5 | 6 | 8 |

2. Solve the following:

(a) 58 134 + 45 367
(b) 78 954 + 12 236
(c) 89 764 + 97 65
(d) 53 241 + 67 543
(e) 98 756 + 56 744
(f) 65 432 + 87 64
(g) 42 115 + 61 537
(h) 58 764 + 65 744
(i) 54 312 + 68 53

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3. Nida bought a laptop for Rs 59 453 and spent Rs 12 652 on repair. How much total amount did she spend?

4. In January, 83 215 people travelled and in February, 21 084 people travelled from an airport. How many passengers travelled in two months?

5. In a library, there are 42 725 books. Administration decided to add 22 500 new books.
(a) Find the total number of books in the library.
(b) If 23 890 more books are added then find the total number of books

6. A bus covered 23 672 km distance in first month, in the second month the same bus covered a distance of 31 716 km.
(a) Find the total distance covered in two months.
(b) In which month did it cover more distance?



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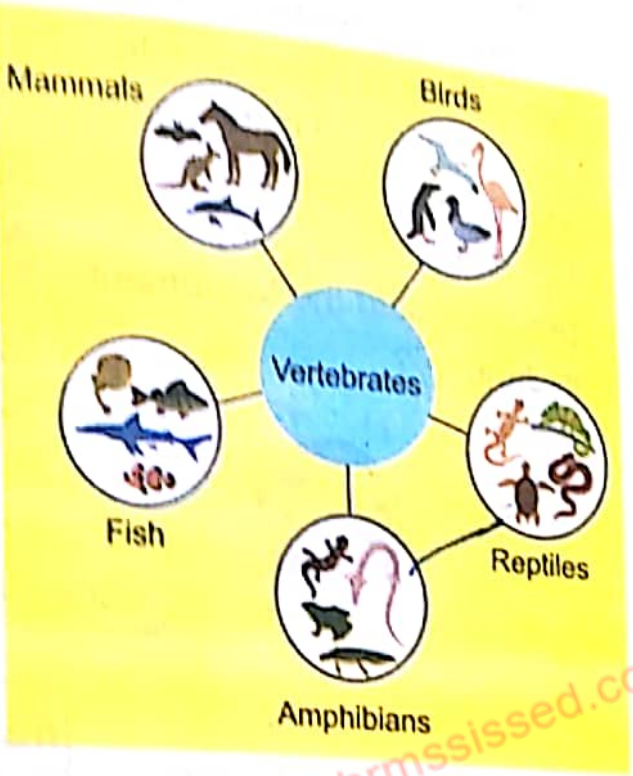
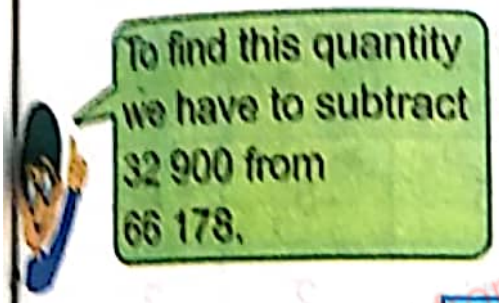
# Subtraction

...mals that have backbone ...ey are called ...brates. If there are 66 178 ...vertebrates out of which ...types are fish. ...many vertebrates are there ...than fish?

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| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| ...l types of vertebrates = | 6 | 5 6 | 10 1 | 7 | 8 |
| Types of fish = | – 3 | 2 | 9 | 0 | 0 |
| Remaining types = | 3 | 3 | 2 | 7 | 8 |

So, 33 278 types of vertebrates are there other than fish.

## Try Yourself

Make any two 5-digit numbers and subtract the smallest number from the greatest number.



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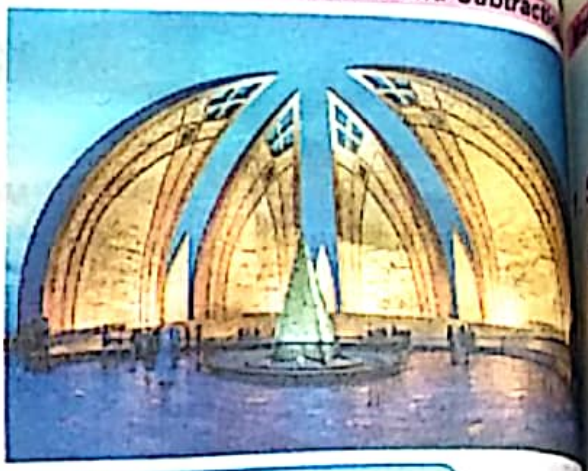
A total of 55 661 people visited the Pakistan Monument in December. In January, 12 255 less people visited as compared to December. How many people visited the Monument in January?



Here, we will subtract 12 255 from 55 661 to find out the less number of visitors who visited in January.

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| Number of visitors came in December = | 5 | 5 | 6 | ⑤ ~~6~~ | ⑪ 1 |
| Number of less visitors came in January as compared to the December = | − 1 | 2 | 2 | 5 | 5 |
| Difference = | 4 | 3 | 4 | 0 | 6 |

So, in January 43 406 visitors came to visit the Pakistan Monument.

## Try Yourself

Subtract the greatest 4-digit number from the smallest 5-digit number.

### Try It!

Find two numbers from the given numbers whose sum is 78 448 and the difference is 15 400.

46 924 72 876 31 524 66 234 89 076

Make small groups of students and ask them to write two 5-digit numbers and then subtract smaller number from greater number.



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## Exercise 2

Solve the following:

(a)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 4 | 3 | 5 | 6 | 2 |
| − | 7 | 3 | 6 | 6 |

(b)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| | 5 | 6 | 8 | 4 |
| − | 3 | 4 | 3 | 8 |

(c)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 9 | 3 | 9 | 2 | 1 |
| − 2 | 4 | 6 | 1 | 8 |

(d)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| | 6 | 5 | 6 | 7 |
| − | 1 | 6 | 4 | 4 |

(e)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 5 | 3 | 5 | 2 | 1 |
| − 3 | 4 | 6 | 4 | 9 |

(f)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| | 3 | 3 | 2 | 7 |
| − | 2 | 6 | 2 | 3 |

(g)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 9 | 6 | 2 | 3 | 7 |
| − 7 | 3 | 4 | 5 | 5 |

(h)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| | 6 | 7 | 4 | 5 |
| − | 3 | 2 | 5 | 1 |

Solve the following:

(a) 45 158 – 34 756 (b) 97 843 – 61 732 (c) 99 754 – 67 584

(d) 25 341 – 16 753 (e) 85 964 – 74 544 (f) 63 541 – 58 463

Saad had Rs 52 490. He bought a bicycle for Rs 15 873.

(a) Now how much money was left with him?

(b) If the price of the bicycle is Rs 18 759, then how much money will be left?

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4. In granary, there are 66 375 bags of wheat and rice. If number o wheat bags are 44 468 then find out the number of rice bags.

5. The students of class 3 collected Rs 35 278 for a welfare institu while the students of class 4 collected Rs 32 184. How much m amount collected by class 3 than class 4?

6. A candidate got 62 436 votes from one constituency while the o candidate got 86 733 votes. How much more votes did the seco candidate get than the first candidate?

## I have learnt to:

- add numbers up to 5-digit.
- solve real-life situations related to addition.
- subtract numbers up to 5-digit.
- solve real-life situations related to subtraction.

**Vocabulary**

- Numbers
- Digit
- Addition
- Subtraction

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## Review Exercise

1. Tick (✓) the correct option.

(a) The sum of 36 529 and 41 372 is equal to:
(i) 77 904 (ii) 77 903 (iii) 77 901 (iv) 77 902

(b) The sum of 17 278 and 62 354 is equal to:
(i) 78 234 (ii) 34 2211 (iii) 79 632 (iv) 213 45

(c) Ayesha had Rs 23 456. Her friend gave her Rs 13 131 more. Now has Rs_____.
(i) 36 587 (ii) 35 467 (iii) 36 434 (iv) 34 567

(d) When we subtract 73 810 from 89 654 then we will get_____
(i) 12 345 (ii) 13 245 (iii) 14 765 (iv) 15 844



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...nd, there were 87 654 fish. If 34 567 fish are shifted to another ...n then _____ fish will be left in the first pond.

(i) 53 123 (ii) 53 456 (iii) 53 087 (iv) 53 567

Solve the following:

(a)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 6 | 7 | 4 | 3 | 6 |
| − 5 | 4 | 8 | 3 | 9 |

(b)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 6 | 3 | 5 | 6 | 3 |
| + 4 | 2 | 8 | 2 | 7 |

(c)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 7 | 8 | 9 | 3 | 8 |
| − 1 | 2 | 4 | 7 | 5 |

(d)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 6 | 7 | 3 | 4 | 3 |
| − 4 | 1 | 2 | 3 | 5 |

(e)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 8 | 3 | 8 | 9 | 3 |
| − 2 | 3 | 1 | 0 | 1 |

(f)

| T.th | Th | H | T | O |
|---|---|---|---|---|
| 3 | 3 | 2 | 7 | 5 |
| − 2 | 6 | 2 | 3 | 8 |

Solve the following:

(a) 45 234 + 12 345 (b) 24 567 + 13 466 (c) 90 766 + 38 967

(d) 45 525 – 23 145 (e) 76 247 – 74 166 (f) 46 016 – 20 989

In the first week, 23 456 people went to visit the beach and in the second week 34 567 people went to visit the beach. Find:

(a) The total number of people visited the beach in two weeks.

(b) In which week less people visited the beach and by how much difference?

There were 12 345 cattle in a farm. If 34 567 more cattle are added, then find:

(a) How many cattle were there in the farm altogether?

(b) If 26 754 were goats out of the total, then what was the number of cattle other than goats?

There are 45 765 trees in a forest. If 32 124 are cactus trees, then find the number of trees other than cactus?

Arsalan has Rs 51 346. He wants to buy a laptop which costs Rs 75 432. How much more amount does he need to buy the laptop?

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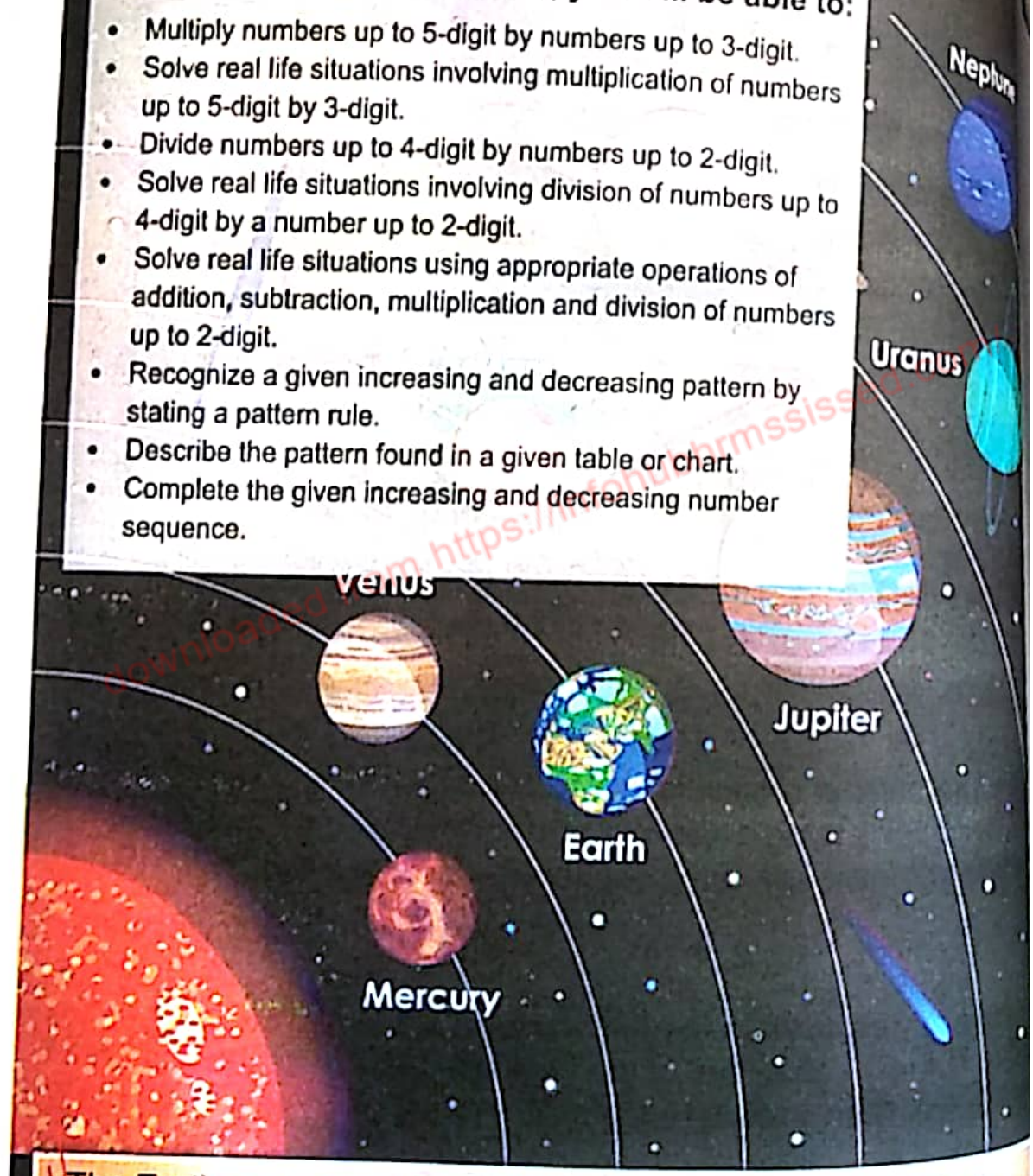
# Multiplication and Divisio

## Learning Outcomes

**After completing this section, you will be able to:**

- Multiply numbers up to 5-digit by numbers up to 3-digit.
- Solve real life situations involving multiplication of numbers up to 5-digit by 3-digit.
- Divide numbers up to 4-digit by numbers up to 2-digit.
- Solve real life situations involving division of numbers up to 4-digit by a number up to 2-digit.
- Solve real life situations using appropriate operations of addition, subtraction, multiplication and division of numbers up to 2-digit.
- Recognize a given increasing and decreasing pattern by stating a pattern rule.
- Describe the pattern found in a given table or chart.
- Complete the given increasing and decreasing number sequence.




The Earth completes its revolution around the sun in 365 days, approximately. In how many days will it complete 3 revolutions?



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# Multiplication

If a person walks 6213 steps in a day, find out how many steps will he walk in 3 days?

By multiplying 6213 with 3 we will find out the total number of steps. Multiply every digit of 6213 with 3.

**Step 1** Multiply 3 ones with 3.

| Th | H | T | O |
|---|---|---|---|
| 6 | 2 | 1 | 3 |
| × | | | 3 |
| | | | 9 |

**Step 2** Multiply 1 ten with 3.

| Th | H | T | O |
|---|---|---|---|
| 6 | 2 | 1 | 3 |
| × | | | 3 |
| | | 3 | 9 |

**Step 3** Multiply 2 hundreds with 3.

| Th | H | T | O |
|---|---|---|---|
| 6 | 2 | 1 | 3 |
| × | | | 3 |
| | 6 | 3 | 9 |

**Step 4** Multiply 6 thousands with 3.

| Th | H | T | O |
|---|---|---|---|
| 6 | 2 | 1 | 3 |
| × | | | 3 |
| 1 | 8 | 6 | 3 | 9 |

So, he will walk 18 639 steps in 3 days.

Ask the students to write few 5-digit numbers and few 3-digit numbers. Multiply a 5-digit number with a 3-digit number.

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Find the product of 10 231 and 65.

| | | | | | |
|---|---|---|---|---|---|
| | 1 | 0 | 2 | 3 | 1 |
| × | | | | 6 | 5 |
| | | 5 | 1 | 1 | 5 | 5 |
| + | 6 | 1 | 3 | 8 | 6 | 0 |
| | 6 | 6 | 5 | 0 | 1 | 5 = |

Multiplicand

Multiplier

10 231 × 5

10 231 × 6

Product

10 231 × 65 = 665 015

The cost of one phone tablet is Rs 78 450. If a company sold 525 tablets. Then, find out in how much amount did he sell all the tablets?

By multiplying the price of one phone tablet with total number of tablets, we will get the total amou

Cost of one phone tablet = 78 450

Total phone tablets = 525

The cost of 525 tablets = 78 450 × 5

= Rs 41 186

| | T.th | Th | H | T | O |
|---|---|---|---|---|---|
| | 7 | 8 | 4 | 5 | 0 |
| ^ | | | 5 | 2 | 5 |
| | 3 | 9 | 2 | 2 | 5 | 0 |
| | 1 | 5 | 6 | 9 | 0 | 0 | 0 |
| + | 3 | 9 | 2 | 2 | 5 | 0 | 0 | 0 |
| | 4 | 1 | 1 | 8 | 6 | 2 | 5 | 0 |

78 450 × 5

78 450 × 20

78 450 × 500

So, the company sold 525 tablets for Rs 41 186 250.

### Try Yourself

Multiply the greatest 4-digit number with the greatest 3-digit number. Multiply the smallest 3-digit number with smallest 5-digit number.



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Now, we will multiply 32 and 5 in a different way.

First of all, write 32 in the expanded form.

$32 = 30 + 2$

(i) Now, write 30 + 2 horizontally and 5 vertically in a grid as shown in the table.

| | 30 | 2 |
|---|---|---|
| 5 | | |

(ii) Multiply each number in the horizontal cells by the number 5 in the vertical cells.

| × | 30 | 2 |
|---|---|---|
| 5 | 150 | 10 |

(iii) Finally, add all the obtained numbers.

$150 + 10 = 160$

As, 160 is the product of 32 and 5.

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## Exercise 1

1. Solve the following:

(a) 631× 4 (b) 431 × 35 (c) 8 434 × 31

(d) 8 046 × 678 (e) 7 601 × 546 (f) 41 175 × 80

(g) 79 762 × 15 (h) 63 506 × 303 (i) 11 098 × 237

2. A shopkeeper sold 34 523 m cloth in a week. How much cloth will he sell in 21 weeks?

3. Liaqat earns Rs11 045 in a day. Find:
   (a) How much money will he earn in 365 days?
   (b) How much money will he earn in 2 years?

4. In a Factory, 20 134 notebooks were printed in a day. How many notebooks will be printed in 210 days?

5. Each member of a group give Rs 34 156 for a tour of Naran and Kagan. If there are 345 member of the group, then how much money will the group collect altogether?



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# Division

84 students from a school went to visit the river side. They were given a boat to visit. 6 students could visit the river side in one round. In how many rounds will all the students visit the river?

Dividing the total number of students by 6, find out the number of rounds taken by the boat, so that all the students will have a boat ride.

Number of students visited the river side = 84

Number of students who could visit the river side in one round = 6

Total number of rounds = 84 ÷ 6

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In 84, divide the highest place value digit '8' by 6.

Recall the table of 6. $1 \times 6 = 6$

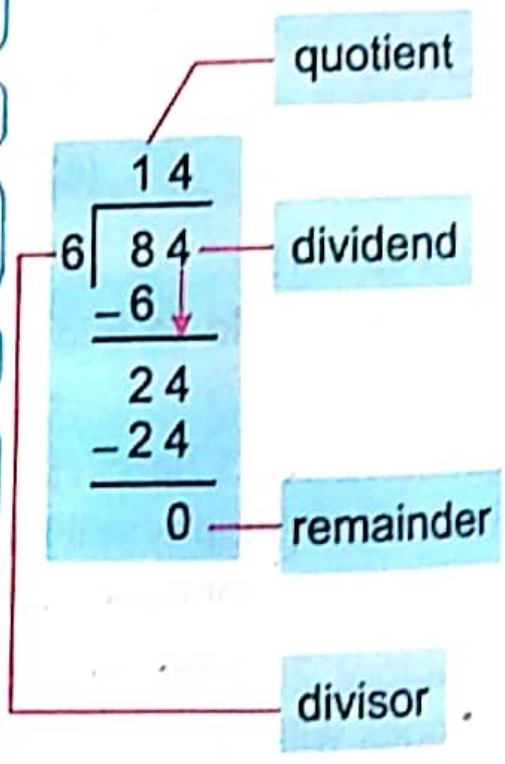
Write '1' as the quotient and write 6 below 8.

Subtract 6 from 8. $8 - 6 = 2$

Drop down 4 next to 2. Now, we have number 24.

$4 \times 6 = 24$

Write '4' at ones place in the quotient and write 24 below 24 and subtract. So, the remainder will be 0.




$84 \div 6 = 14$

So, in 14 rounds all the students will visit the river side.

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...e 9 528 by 48 and find quotient and remainder.

```
      198   ← Quotient
48 ) 9528
   - 48
   ----
     472
   - 432
   -----
      408
   -  384
   ------
       24   ← Remainder
```

9 518 ÷ 48

Quotient = 198

Remainder = 24

I have 1 455 lego blocks. Can I pack them equally in 12 packets?

For this, 1 455 will have to be divided by 12.

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Number of lego blocks = 1455

Number of packets = 12

...e number of lego blocks = 1455 ÷ 12
...each packet

```
      121   ← Quotient
12 ) 1455
   - 12
   ----
     25
   - 24
   ----
      15
   -  12
   -----
       3   ← Remainder
```

...e number of blocks in = 121
...each packet

Remaining blocks = 3

Ask the students to write some 4-digit numbers and some 2-digit numbers. Divide a 4-digit number by a 2-digit number.



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A company sold two types of USBs, Type-1 and Type-2. Total 9 655 USBs were sold. In which 3 571 USBs were of Type-1. Find:

(a) How many Type-2 USBs were sold?

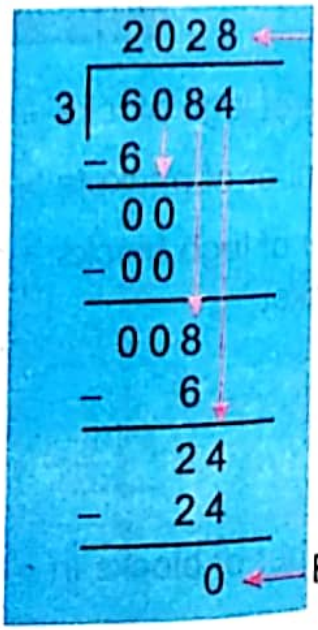
(b) If Type-2 USBs were sold to three shopkeepers, then how many USBs each of them got?

To find the number of Type-2 USBs, subtract the Type-1 from the total number of USBs.

$9655 - 3571 = 6084$

(a) So, 6084 Type-2 USBs were sold.

To find out the number of USBs that each shopkeeper gets, we divide 6 084 by 3.




(b) So, each shopkeeper gets 2028 Type-2 USBs.

**Try Yourself**

A shopkeeper has three coloured blocks. The blocks in blue colour are 245. The red block are three times more than blue blocks. The green blocks are 415 less than the red blocks. Find the total number of blocks?



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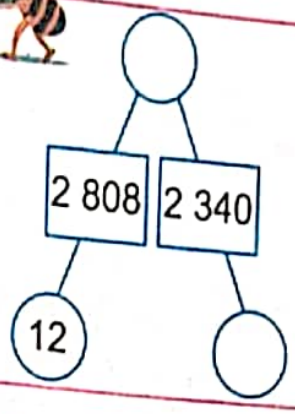
**Try It!**

The numbers given in the boxes are the product of the numbers given in the two circles next to these squares. Find and write the correct numbers in the blank circles.




## Exercise 2

1. Solve the following:

(a) $3\overline{)585}$ (b) $4\overline{)1816}$ (c) $42\overline{)6972}$ (d) $22\overline{)7546}$

(e) $23\overline{)9568}$ (f) $31\overline{)9641}$ (g) $12\overline{)2868}$ (h) $32\overline{)7392}$

(i) 133 ÷ 11 (j) 1 056 ÷ 8 (k) 1 848 ÷ 88

(l) 4 662 ÷ 42 (m) 6 125 ÷ 10 (n) 2 060 ÷ 23

2. In 45 relief camps, 2 244 blankets were distributed. How many blankets did each camp get?
3. If 1 107 chairs are placed in 27 rows, then how many chairs will be there in a row?
4. If 3 032 biscuits are packed in 11 boxes, then find out how many biscuits are there in a box?
5. If 6 666 books are to be kept in 33 cupboards in a library, then how many books will be there in each cupboard?
6. Saad bought 10 washing machines for Rs 78 950 and an oven for Rs 21 550. Find:
   (a) How much money did he spend altogether?
   (b) How much more amount did he spend on washing machines than an oven?
   (c) How much amount did he spend on a washing machine?
7. In 30 bags, 1 350 kg rice are packed. Find:
   (a) How many kilogram of rice are in one bag?
   (b) How many kilogram of rice will be packed in 38 bags?

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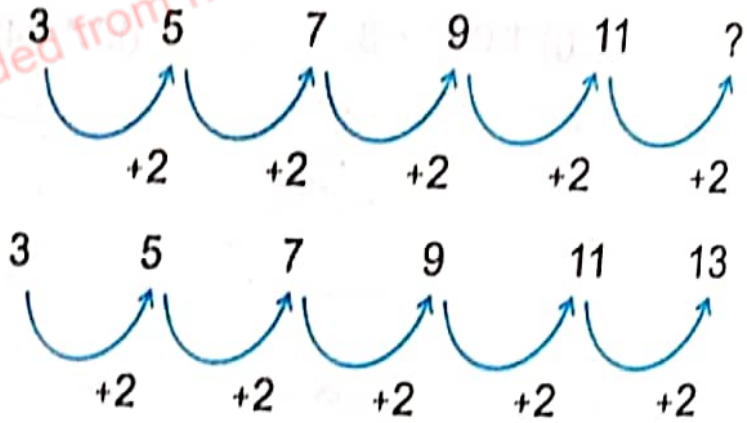
# Patterns

Ibrahim learns few new words with meanings every week. In the first week, he learnt 3 words. In the second week, he learnt 5 words, in the third week 7 words, in the fourth week 9 words and in the fifth week he learnt 11 words. If he keeps learning new words like this then find the number of words he would learn in sixth week?

Write in order all the number of words that he learnt:

3, 5, 7, 9, 11, ____

Now, identify the rule in this order.




So, he would learn 13 words in the sixth week.

Ibrahim is learning with a special order. Here, the rule is "adding 2" means to get the next term, we add 2 in the previous term. This sequence is known as arithmetic sequence.

**Key Fact**

The rule of number pattern tells us how one member or number in this pattern is obtained from another member or number.

**Try Yourself**

Find the next two terms of this sequence.

5, 10, 15, 20, ____, ____

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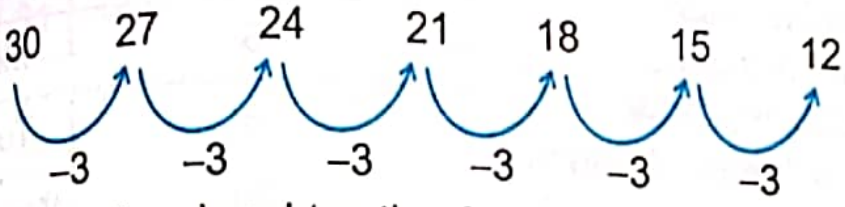
30, 27, 24, 21, 18, _____, _____

Now, observe the pattern given above, identify the rule and find out the next two terms.

If we look at terms of this pattern we observe that we get the next term by subtracting 3 from the previous term.




So, the rule of pattern is subtracting 3.
The next two terms of this pattern will be 15 and 12.

We can observe different patterns in charts or tables. Look at the given hundreds chart.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

The pattern of red boxes shows that each next number is obtained by adding 10 to the previous number.

If we move from 95 to the top, along the yellow boxes, we can observe that every next digit in the pattern is being formed by subtracting 11 from the previous number.

## Try Yourself

Observe the hundreds chart and find at least 2 patterns of different mathematical operations. Also find the rules of that patterns.

Divide the students into two groups, ask them to make at least 5 patterns. Give the pattern developed by one group to the other group and ask them to identify the rules of these patterns.



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The table below shows the number of pages of a story Sehrish rea daily. If she continued to read the pages of the story with the same pattern, then how many pages would she read by Friday?

If we observe the terms of the number pattern in this table, we will find that two pages are being added everyday. Its means, this is the pattern of addition.

Rule of pattern: Adding 2

2, 4, 6, 8, 10, 12, 14

So, Shehrish will read 14 pages till Friday.

| Pages Read | Days |
|---|---|
| 2 | Saturday |
| 4 | Sunday |
| 6 | Monday |
| 8 | Tuesday |
| 10 | Wednesday |
| 12 | Thursday |

**Try It!**

Complete the patterns.

(a) 2,3,5,8,12, ____, ____.

(b) 40,35,29,22, ___, ____.

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## Exercise 3

1. Observe the given patterns, describe the rule and write the next tw terms.

(a) 11, 15, 19, 23, 27, ____, _____.

(b) 30, 60, 90, 120, 150, _____, _____.

(c) 6, 12, 18, 24, 30, _____,_____.

(d) 850, 800, 750, 700, 650, _____, _____.

(e) 106, 103, 100,97, 94____, _____.

(f) 284, 288, 292, 296,_____, _____.

(g) 560, 540,520, 500, _____, _____.



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Observe the given chart and find at least 5 patterns. Also set the rules for these patterns.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

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Observe the table given below and describe the rule of pattern.

(b)

| Rule of pattern | |
|---|---|
| Weeks | Height of the plant |
| 1 | 4 cm |
| 2 | 8 cm |
| 3 | 12 cm |
| 4 | 16 cm |
| 5 | 20 cm |

| Rule of pattern | |
|---|---|
| Boxes of blocks | Total number of blocks |
| 1 | 20 |
| 2 | 40 |
| 3 | 60 |
| 4 | 80 |
| 5 | 100 |



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## I have learnt to:

- multiply 5-digit number with 3-digit numbers.
- solve real-life situation related to multiplication of 5-digit numbers with 3-digit numbers.
- divide 4-digit numbers by 2-digit numbers.
- solve real-life situations of division of 4-digit number by 2-digit number.
- solve real-life situations using appropriate operations of addition, subtraction, multiplication and division of numbers.
- recognize increasing and decreasing pattern by stating a pattern rule.
- describe the pattern found in a given table or chart.
- complete the increase or decreasing number sequence.

**Vocabulary**

- Numbers
- Digit
- Multiply
- Division
- Pattern
- Table

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## Review Exercise

1. Tick (✓) the correct option.

(a) There are 4 500 plants in 90 rows. Each row contains equal number of plants. Find the number of plants in a row.

(i) 100 (ii) 10 (iii) 5 (iv) 50

(b) If the price of one book is Rs 250, then the price of 22 books will be _____.

(i) Rs 5 555 (ii) Rs 5 550 (iii) Rs 5 500 (iv) Rs 5 [illegible]

(c) By dividing 3 960 by 88, we will get _____.

(i) 41 (ii) 47 (iii) 46 (iv) 45



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The next term in 6, 18, 30, 42, is _____.
(i) 48 (ii) 54 (iii) 56 (iv) 46

The next term in 88, 78, 68, is _____.
(i) 98 (ii) 58 (iii) 48 (iv) 47

Solve the following:
(a) 245 × 2 (b) 743 × 12 (c) 4 324 × 41
(d) 1 245 × 13 (e) 67 453 × 345 (f) 78 965 × 453

Solve the following:
(a) 380 ÷ 5 (b) 196 ÷ 12 (c) 2 925 ÷ 6
(d) 3 294 ÷ 61 (e) 1 766 ÷ 22 (f) 2 205 ÷ 49

A bus has the capacity of 45 passengers. How many buses would be needed for 1 575 passenger?

A car covers a distance of 1 288 km in 23 hours. Find:
(a) How much distance would it cover in one hour?
(b) How much distance would it cover in 11 hours?

A man pays Rs 23 452 as one month installment of the car. Find:
(a) How much amount will he pay in 2 years?
(b) How much amount will he pay in 3 years?

Zaeem has 1 867 lego blocks. His sister gives him 4 more boxes of lego blocks. There are 1 205 lego blocks in each box. How many lego blocks Zaeem has in total?

Observe the given patterns, identify the rule and write the next two terms.

(a) 3, 9, 15, 21, ____, _____.
(b) 100, 90, 80, 70, 60 _____, _____.
(c) 12, 18, 24, 30, 36, _____,_____.
(d) 2, 10, 18, 26, 34_____, _____, _____.
(e) 106, 95, 84, 73, 62,____, _____.

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# Unit 2

# Factors and Multiples

## Learning Outcomes

**After completing this unit, you will be able to:**

- Identify divisibility rules for 2, 3, 5, and 10.
- Use divisibility tests for 2, 3, 5 and 10 on numbers up to 5 digits.
- Identify and differentiate 2-digit prime and composite numbers.
- Find factors of a number up to 50.
- List the first ten multiples of a 1-digit number.
- Differentiate between factors and multiples.
- Factorize a number by using prime factors.
- Determine common factors of two or more 2-digit numbers.
- Determine common multiples of two or more 2-digit numbers.

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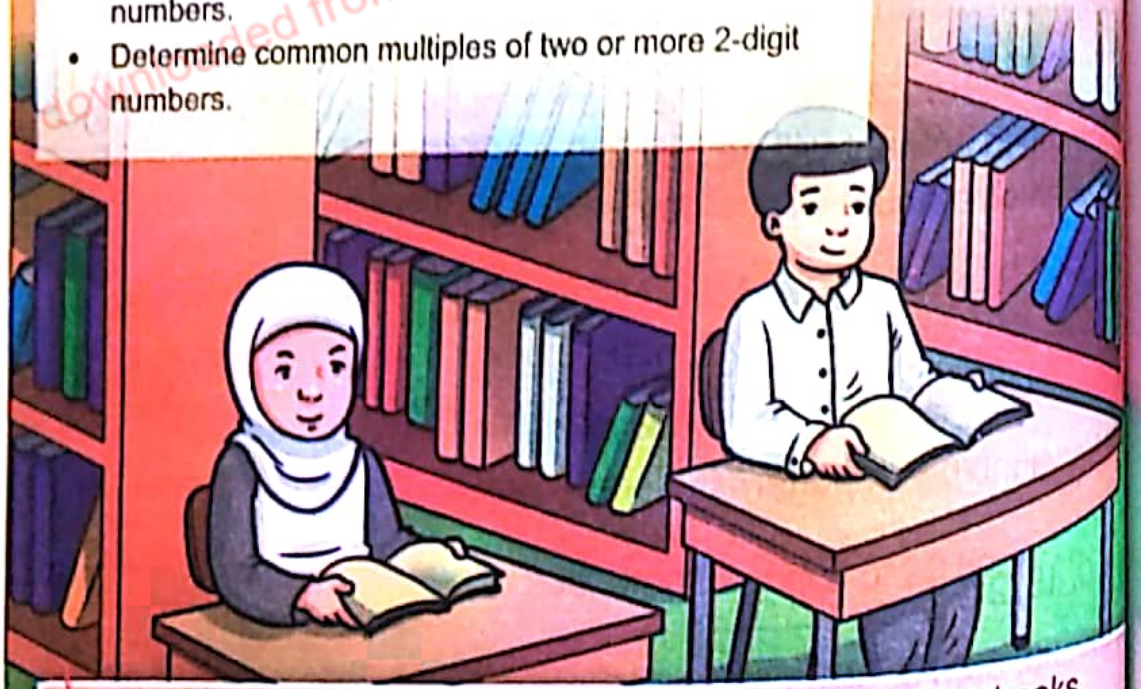

Maria works in a library. There are 24 mathematics books. She wants to put these books in 4 shelves so that each shelf has equal number of books. In how many ways can she put the books?



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# Divisibility Rule

A divisibility rule tells that a number is divisible by another number or not. Here, are some rules that would help us.

If the digit at the ones place is 0, 2, 4, 6 or 8, then the number is divisible by 2.

All these numbers are divisible by 2.

If the sum of all digits of a number is divisible by 3, then the number is divisible by 3.

All these numbers are divisible by 3.

63 is divisible by 3.
∵ 6 + 3 = 9
9 is divisible by 3.

28 is not divisible by 3.
∵ 2 + 8 = 10
10 is not divisible by 3.

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## Try Yourself

Amar has Rs 5040. Is this amount divisible by 3?



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If the digit at the ones place is 0 or 5, then the number is divisible by 5.

All these numbers are divisible by 5.

## Try Yourself

The total number of pages in a book are 98,230. Can we divide these pages into groups of 5?

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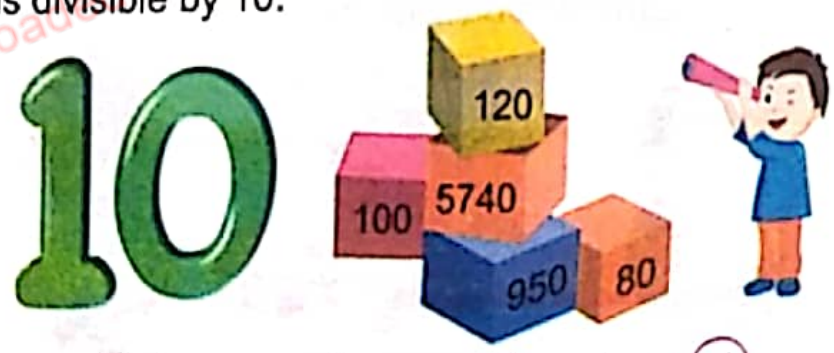
If the digit at the ones place is 0, then the number is divisible by 10.




All these numbers are divisible by 10.

## Key Fact

If a number is divisible by 2 and 5, then the number is also divisible by 10.

## Try It!

Write 5 numbers that are completely divisible by 2, 3, 5 and 10.

Give flash cards of numbers to students. By using divisibility rules, list numbers that are divisible by 2,3,4,5 or 10.



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## Exercise 1

1. Tick (✓) the numbers that are divisible by 2.

a 16 ✓
b 43
c 98 ✓
d 134 ✓
e 6781
f 2114 ✓
g 9226 ✓
h 67
i 540 ✓
j 82420 ✓

2. Tick (✓) the numbers that are divisible by 3.

a 20
b 27 ✓
c 165 ✓
d 125
e 6720 ✓
f 8955 ✓
g 52110 ✓
h 21945 ✓

3. Tick (✓) the numbers that are divisible by 5.

a 30 ✓
b 50 ✓
c 7,895 ✓
d 2,298
e 56,560 ✓
f 1,982
g 42,420 ✓
h 130 ✓

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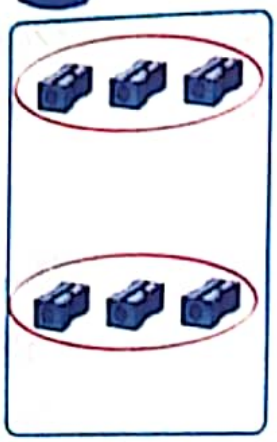
# Factors and Multiples

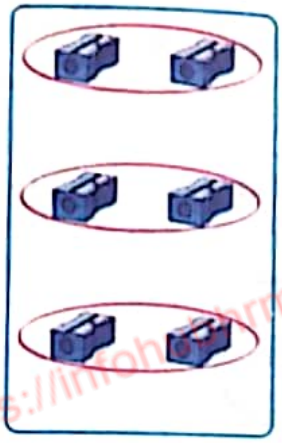
Fawad wants to put 6 sharpeners in rows so that each row has an equal number of sharpeners. In how many ways can he do this?

Fawad will keep them in the following ways:



2 rows of 3 sharpeners

$2 \times 3 = 6$

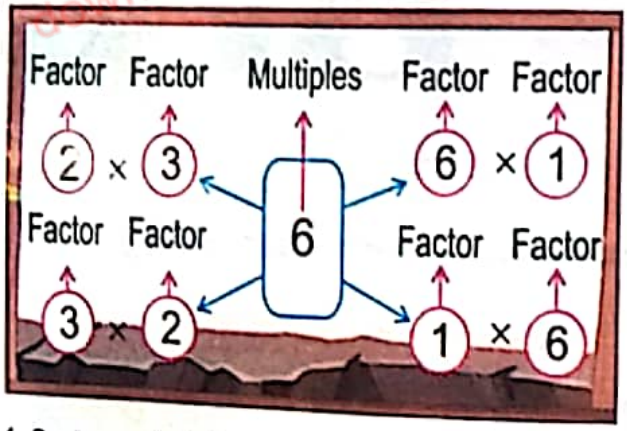


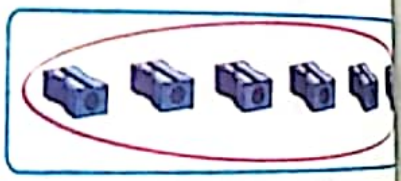
3 rows of 2 sharpeners

$3 \times 2 = 6$

6 rows of 1 sharpener

$6 \times 1 = 6$



1 row of 6 sharpeners

$1 \times 6 = 6$

1,2, 3 and 6 divides 6 completely. Therefore 1, 2, 3 and 6 are factors of 6 and 6 is their multiple.

Multiple is the product when we multiply one number by an other number.

**Key Fact**

When a number completely divides the other number then number is called factor of that number.



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Let's find out the factors of 7.

$7 = 1 \times 7$

$7 = 7 \times 1$

The factors of 7 are 1 and 7.

So, 7 is a prime number.

**Key Fact**

Every number is a factor of itself and 1 is the factor of every number.

The numbers greater than 1 which have two factors, 1 and the number itself. Such numbers are called prime numbers.

Let's find out the factors of 21.

$21 = 1 \times 21$

$21 = 3 \times 7$

$21 = 7 \times 3$

$21 = 21 \times 1$

So, 1, 3, 7 and 21 are factors of 21.

Therefore, 21 is a composite number.

**Try Yourself**

What is the greatest composite number between 1 and 100 and what is smallest composite number?

The numbers whose factors are more than two, called composite numbers.

Find out the first 10 multiples of 2.

To find the first 10 multiples of 2, recall the table of 2.

So, the first 10 multiples of 2 are as follows:

2, 4, 6, 8, 10, 12, 14, 16, 18, 20

**Try Yourself**

How many numbers that 10 have their multiples?

To remind the students tell the difference between factor and multiple. Ask them to write some numbers in their notebook and find their factors and multiples. Give some flash cards of numbers to students and ask them to separate out prime and composite numbers.



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Find out the first 10 multiples of 7.

To find the first 10 multiples of 7, recall the table of 7.

So, the first 10 multiples of 7 are as follows:

**7, 14, 21, 28, 35, 42, 49, 56, 63, 70**

Let's consider the factors and multiples of 8.

**Factors of 8**

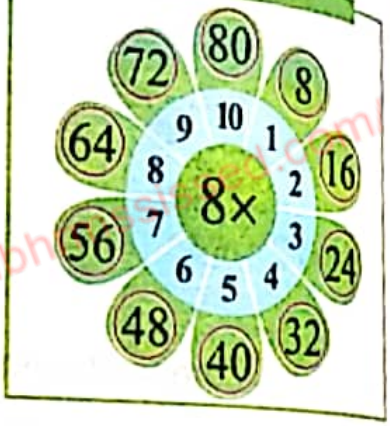
8 = (1) × 8

8 = (2) × 4

8 = (4) × 2

8 = (8) × 1

**Multiples of 8**




1,2,4 and 8 are the factors of 8.

The first 10 multiples of 8 are as follow:

**8, 16, 24, 32, 40, 48, 56, 64, 72, 80**

**Try It!**

Write 5 prime numbers.

## Exercise 2

1. Write all composite numbers between 30 and 50.

2. Encircle the prime numbers.

(a) 15 (b) 31 (c) 42 (d) 67

(e) 11 (f) 52 (g) 98 (h) 89



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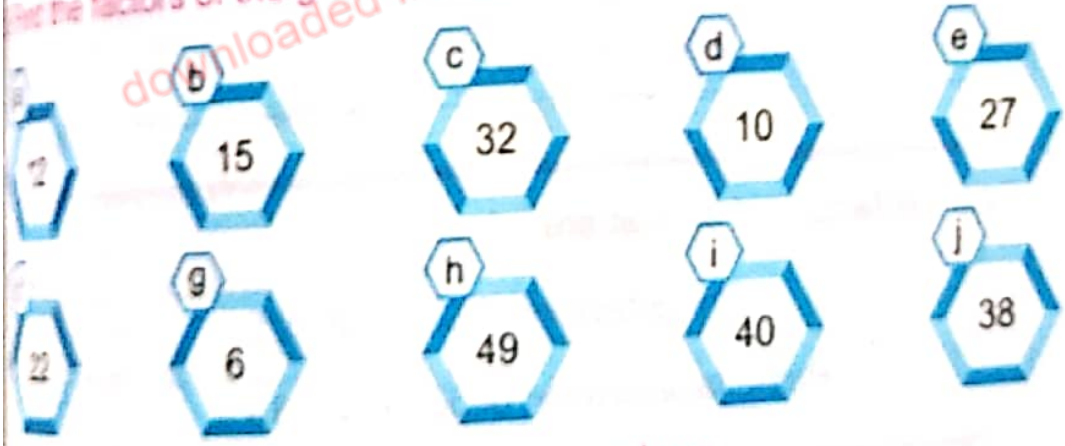
...the first 15 prime numbers.

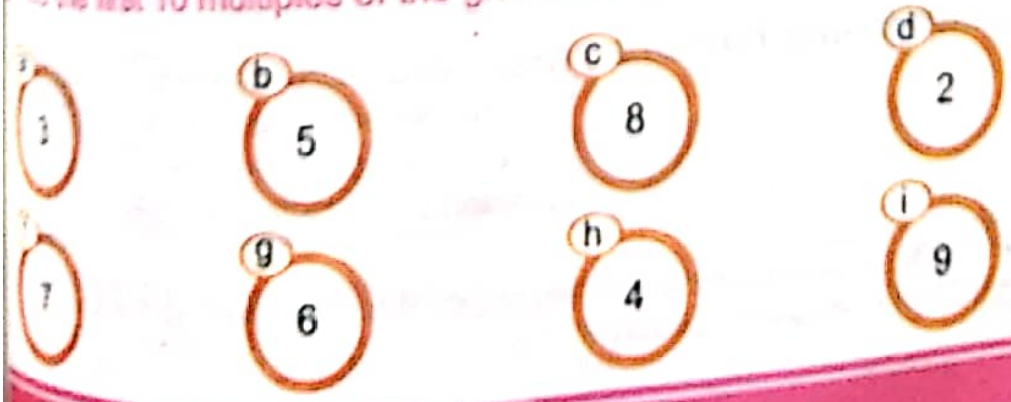
...the composite numbers and colour them.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 11 | 21 | 31 | 41 | 51 | 61 | 71 | 81 | 91 |
| 1 | 12 | 22 | 32 | 42 | 52 | 62 | 72 | 82 | 92 |
| 2 | 13 | 23 | 33 | 43 | 53 | 63 | 73 | 83 | 93 |
| 3 | 14 | 24 | 34 | 44 | 54 | 64 | 74 | 84 | 94 |
| 4 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | 95 |
| 5 | 16 | 26 | 36 | 46 | 56 | 66 | 76 | 86 | 96 |
| 6 | 17 | 27 | 37 | 47 | 57 | 67 | 77 | 87 | 97 |
| 7 | 18 | 28 | 38 | 48 | 58 | 68 | 78 | 88 | 98 |
| 8 | 19 | 29 | 39 | 49 | 59 | 69 | 79 | 89 | 99 |
| 9 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 10 | | | | | | | | | |

...the factors of the given numbers.




...the first 10 multiples of the given numbers.

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# Prime Factorization

Let's find out the factors of 8.

$8 = 1 \times 8$

$8 = 2 \times 4$

| | |
|---|---|
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

Let's we find the prime factors of 8.

Prime factor of 8 = 2, 2, 2

2, 2 and 2 are the prime factors of 8.

Prime factorization of 8 = $2 \times 2 \times 2$

Do you know what is prime factorization?

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The process of writing a number as a product of its factors is called factorization. The factorization in which all factors are prime is called prime factorization.

Find the factors of 30 that are prime.

| | |
|---|---|
| 2 | 30 |
| 3 | 15 |
| 5 | 5 |
| | 1 |

Prime factors of 30 = 2, 3, 5

Prime factorization of 30 = $2 \times 3 \times 5$

## Common Prime Factors

When two or more numbers have the same prime factors, those factors are called the common prime factors.

Write a few numbers on the writing board and ask the students to find t factors using prime factorization.



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Find the common prime factors of 12 and 16.

Prime factorization of 12 = $2 \times 2 \times 3$

Prime factorization of 16 = $2 \times 2 \times 2 \times 2$

| 2 | 12 |
|---|---|
| 2 | 6 |
| 3 | 3 |
| | 1 |

| 2 | 16 |
|---|---|
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

Common prime factors = 2 , 2

Find the common prime factors of 18 and 27.

Prime factorization of 18 = $2 \times 3 \times 3$

Prime factorization of 27 = $3 \times 3 \times 3$

| 2 | 18 |
|---|---|
| 3 | 9 |
| 3 | 3 |
| | 1 |

| 3 | 27 |
|---|---|
| 3 | 9 |
| 3 | 3 |
| | 1 |

Common prime factors = 3 , 3

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Find the common prime factors of 9, 15 and 12.

Prime factorization of 9 = $3 \times 3$

Prime factorization of 15 = $3 \times 5$

Prime factorization of 12 = $2 \times 2 \times 3$

Common prime factors = 3

Find the common prime factors of 30 and 45.

Write a few numbers on the writing board and ask the students to find the common prime factors using prime factorization.



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# Common Multiples

Find the common multiples of 6 and 8.

To find the common multiples of two or more number, first we write some multiples of these numbers, then we will encircle the common multiples.

Now, we write the multiples of numbers, then encircle the common multiples.

Multiples of 6 = 6, 12, 18, (24), 30, 36, 42, (48), 54, 60

Multiples of 8 = 8, 16, (24), 32, 40, (48), 56, 64, 72, 80

First two common multiples of 6 and 8 are 24 and 48.

A number that is a multiple of two or more numbers is called the common multiple.

## Find common multiple of 10, 15 and 12.

Multiples of 10 = 10, 20, 30, 40, 50, (60), 70, 80, 90

Multiples of 15 = 15, 30, 45, (60), 75, 90, 105, 120, 135

Multiples of 12 = 12, 24, 36, 48, (60), 72, 84, 96, 108

The first common multiple of 10, 15 and 12 is 60

**Try Yours**

1. Find first two common multiples and 15.
2. Find the first common multiple and 24.

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## Exercise 3

1. Find the prime factors of the given numbers.

Write few numbers on the writing board and ask the students to find the common multiples of the numbers.



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matics 4

d the common prime factors of the given numbers.

6, 18

14, 30

4, 8

b 10, 20

e 7, 21, 28

h 13, 39

c 24, 32, 18

f 20, 25, 15

i 5, 30, 12

nd the first common multiple of the given numbers.

3, 5

12, 22

7, 14

b 9, 12

e 8, 4, 16

h 6, 15

c 10, 20, 30

f 51, 17, 34

i 2, 5, 10

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## I have learnt to:

identify the divisibility rule of 2, 3, 5 and 10.
use the divisibility rule of 2, 3, 5 and 9 for 5-digit numbers.
identify and differentiate between prime and composite numbers.
find the factors of numbers up to 50.
find the multiples of 1-digit numbers.
find the difference between factors and multiples.
find the common prime factors by prime factorization.
find the common factors of two or more numbers.
find the common multiples of two or more numbers.

**Vocabulary**

- Prime Numbers
- Composite Numbers
- Divisibility Rule
- Factors
- Multiples
- Prime Factorization



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## Review Exercise

1. Tick (✓) the correct option.

(a) 13 is a _____ number.

(i) composite (ii) common (iii) multiple (iv) prime

(b) If _____ of the all digits of a number is divisible by 3, then number is divisible by 3.

(i) sum (ii) difference (iii) product (iv) quotient

(c) Prime factorization of 24 is:

(i) 8×3 (ii) 1×24 (iii) 2×2×2×3 (iv) 2×5

(d) The common prime factor of 2 and 4 is _____.

(i) 1 (ii) 2 (iii) 4 (iv) 8

(e) The first common multiple of 5 and 10 is _____.

(i) 5 (ii) 10 (iii) 20 (iv) 50

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2. Use the divisibility rule to complete the given table below.

| | Numbers | Divisible by 2 | Divisible by 3 | Divisible by 5 | Divisible |
|---|---|---|---|---|---|
| a | 112 | | | | |
| b | 986 | | | | |
| c | 5409 | | | | |
| d | 5600 | | | | |
| e | 81810 | | | | |
| f | 5912 | | | | |
| g | 53800 | | | | |
| h | 2134 | | | | |



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Mathematics 4

3. Write first 12 composite numbers.

4. Write Prime numbers between 21 and 60.

5. Find the factors of the given numbers.

(a) 10 (b) 25 (c) 35 (d) 46

(e) 23 (f) 16 (g) 4 (h) 47

(i) 58 (j) 20

6. Find the first 6 multiples of the given numbers.

(a) 2 (b) 6 (c) 5 (d) 9

7. Find the prime factors of the given numbers.

(a) 5 (b) 19 (c) 22 (d) 15

(e) 40 (f) 21 (g) 8 (h) 30

(i) 41 (j) 38

8. Find the common prime factors of the given numbers.

(a) 4, 20 (b) 16, 24 (c) 28, 56, 14

(d) 17, 34 (e) 12, 6, 18 (f) 5, 10, 20

9. Find the first common multiple of the given numbers.

(a) 2, 7 (b) 6, 10 (c) 12, 14, 18

(d) 15, 30 (e) 5, 15, 20 (f) 6, 12, 15

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# Unit 3

# Fractions

## Learning Outcomes

**After completing this unit, you will be able to:**

- Recognize like and unlike fractions.
- Compare two unlike fractions by converting them to equivalent fractions with the same denominator.
- Simplify fractions to the lowest form.
- Identify (unit, proper, improper) fractions and mixed numbers.
- Convert improper fractions into mixed numbers and vice versa.
- Arrange fractions in ascending and descending order.
- Add fractions with like denominators.
- Subtract fractions with like denominators.
- Multiply a fraction (proper, Improper) and mixed number by a whole number.
- Multiply two fractions (proper, Improper) and mixed numbers.
- Divide a fraction(proper, Improper) and mixed numbers by a whole number.
- Analyze real life situations involving fractions by identifying appropriate number operations.

Danyal designed a garden in his home. On one-tenth of the garden he grew roses. On the remaining part, he grew other plants. How many parts did he use to grow other plants?



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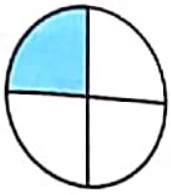
# Like and Unlike Fractions

Komal and Waleed start to read a story book. Komal reads $\frac{3}{4}$ pages of the book in one day and Waleed read $\frac{1}{4}$ pages of the book.

...e represent these fractions by using diagram.

$\frac{3}{4}$



$\frac{1}{4}$

The denominators of both the fractions are same i.e., '4'. Therefore, $\frac{3}{4}$ and $\frac{1}{4}$ are like fractions.

Fractions with same denominator are called Like Fractions.

...ow, consider $\frac{2}{7}$, $\frac{4}{7}$ and $\frac{6}{7}$.

$\frac{2}{7}$

$\frac{3}{7}$

$\frac{6}{7}$

...s 7 is the denominator for all three fractions. Therefore, $\frac{2}{7}$, $\frac{4}{7}$ and $\frac{6}{7}$ ...re like fractions.



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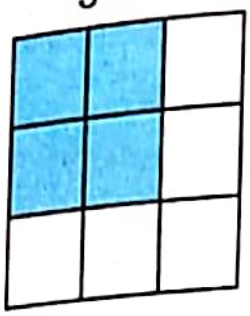
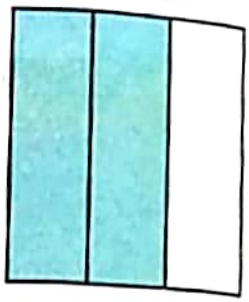
Let's consider $\frac{4}{9}$ and $\frac{2}{3}$.



$\frac{4}{9}$



$\frac{2}{3}$

The denominators for $\frac{4}{9}$ and $\frac{2}{3}$ are different.

Fractions with different denominators are called Unlike Fractions.

Therefore, $\frac{4}{9}$ and $\frac{2}{3}$ are unlike fractions.

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**Try Yourself**

Separate the like and unlike fractions.

(a) $\frac{1}{8}, \frac{3}{8}$ (b) $\frac{4}{5}, \frac{7}{11}, \frac{1}{9}$ (c) $\frac{3}{7}, \frac{4}{5}$ (d) $\frac{4}{6}, \frac{5}{6}, \frac{1}{6}$

## Comparing unlike fractions

Hadia and Muaz have 2 pizzas of the same size. Hadia cuts her pizza into two equal pieces and ate one piece. Muaz cuts his pizza into 5 equal pieces and ate 3 of it. Who ate more pizza?

TEACHING POINT

Write different fractions on the writing board and ask the students to identify like and unlike fractions.



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To find who ate more pizza.
- Write the eaten part of the pizza in fraction.
- Convert fraction into their equivalent fractions.

an show these fractions with the help of a figure.

compare $\frac{1}{2}$ and $\frac{3}{5}$. To compare these ctions, we will convert these fractions equivalent fractions.
nvert these into equivalent fractions, ultiply these fractions with a number ake there denominators same.

$$\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$$

$$\frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10}$$

umber 6 is greater than number 5.

erefore,

$$\frac{6}{10} > \frac{5}{10}$$

or

$$\frac{3}{5} > \frac{1}{2}$$

Muaz ate more pizza.

**Key Fact**

Fractions are to be called equivalent fractions, in which numerators and denominators are different but the value is same.

**Key Fact**

In like fractions, which fraction has greater numerator is called greater fraction.

**Try Yourself**

Compare the following:

(a) $\frac{1}{4}, \frac{3}{5}$ (b) $\frac{6}{7}, \frac{2}{9}$

(c) $\frac{9}{10}, \frac{2}{5}$ (d) $\frac{7}{8}, \frac{2}{4}$

Make groups of students and give them some flash cards with square grid. Ask them to colour different squares and write in fractional form.



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## Simplification of Fractions

Hamid solves 5 questions out of 10 i.e., $\frac{5}{10}$. Can you write this in the lowest form?

Common factor of 5 and 10 is 5. To write in the lowest form, divide numerator and denominator of the fraction by 5.

$$\frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$$

Now, there is no common factor of 1 and 2.

So, $\frac{1}{2}$ is the lowest form of $\frac{5}{10}$.

**Let's write $\frac{12}{14}$ in its lowest form.**

Common factor of 12 and 14 is 2.

Dividing there numerator and denominator by 2.

$$\frac{12}{14} = \frac{12 \div 2}{14 \div 2} = \frac{6}{7}$$

Now, there is no common factor of 6 and 7.

So, $\frac{6}{7}$ is the lowest form of $\frac{12}{14}$.

**Key Fact**

To write fraction in its lowest form divide numerator and denominator with their common factor.

**Try Yourself**

Asad have 18 candies. He gives 6 candies i.e., $\frac{6}{18}$ candies. Write this fraction in its lowest form.

## Types of Fractions

### Unit fractions

A farmer cultivates sugarcane on one-fourth of his field. It means that he cultivates $\frac{1}{4}$ of his field.

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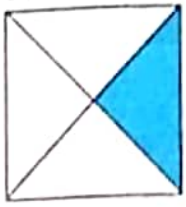
When the numerator of any fraction is 1, then the fraction is called a unit fraction. So, $\frac{1}{4}$ is a unit fraction.

It can be shown with the help of a diagram.

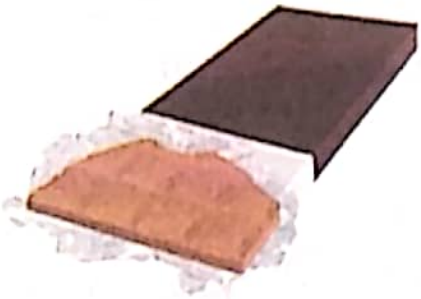


**Key Fact**

Fractions with 1 as a numerator is called unit fraction.

## Proper fractions

I have a chocolate. I ate its 3 pieces out of 10 equal parts. It means that I have eaten $\frac{3}{10}$ of the chocolate.



It can be shown with the help of a diagram.

**Key Fact**

Fraction with numerator smaller than its denominator is called proper fraction.

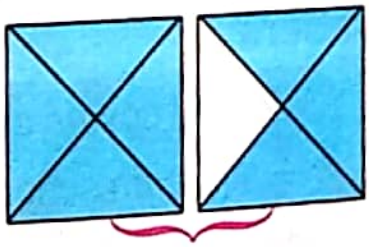
In fraction $\frac{3}{10}$, the numerator 3 is smaller than the denominator 10.

So, $\frac{3}{10}$ is a proper fraction.

## Improper fractions

Consider the following figures:

$\frac{3}{3}$



$\frac{4}{4} + \frac{3}{4} = \frac{7}{4}$



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**Key Fact**

These are improper fractions as:

- In $\frac{3}{3}$, numerator and denominator are same.
- In $\frac{7}{4}$, numerator is greater than the denominator.

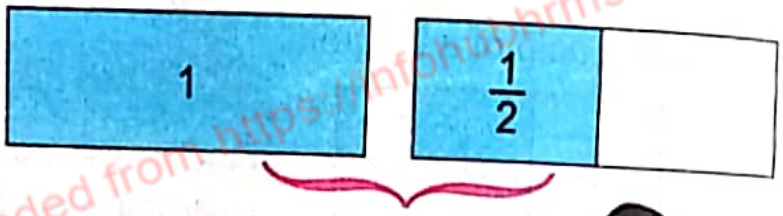
## Mixed numbers

Subhan has two packs of juice. He drinks one full and other half pack. How can we write it in fraction?

**Key Fact**

The fraction with numerator greater than the denominator is called improper fraction.

We can show it with the help of figure as.




We can write it in mixed number as:

$1\frac{1}{2} = 1 + \frac{1}{2}$ Mixed number

Mixed number is the sum of whole number '1' and proper fraction '$\frac{1}{2}$'.

**Key Fact**

A mixed number / mixed fraction consists of a whole number and a proper fraction.

# Conversion of fractions

## Conversion of improper fractions to mixed numbers

Waheed covers a distance of $\frac{7}{3}$ km from school to home daily. How much distance does he cover daily. Write in mixed number.

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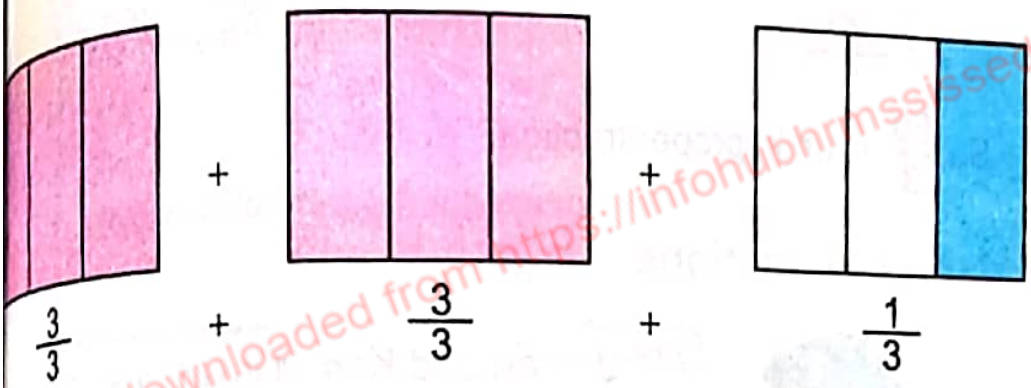
To convert the improper fraction $\frac{7}{3}$ into mixed number, we divide numerator by denominator.

$$3\overline{)7}\quad 2,\ -6,\ 1$$

$$\frac{7}{3} = 2 + \frac{1}{3} = 2\frac{1}{3}$$

A mixed number can be written like this:

$$7 \div 3 = 2\frac{1}{3}$$



$$\frac{3}{3} + \frac{3}{3} + \frac{1}{3}$$

$$= 1 + 1 + \frac{1}{3}$$

$$= 2 + \frac{1}{3}$$

$$= 2\frac{1}{3}$$

**Try Yourself**

Convert $\frac{9}{4}$ and $\frac{11}{6}$ into mixed number.

## Conversion of mixed number to improper fractions

Ahmad walks $2\frac{1}{3}$ hours in a garden daily. Convert the mixed number into improper fraction.

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$2\frac{1}{3} = \frac{(2\times3)+1}{3} = \frac{6+1}{3} = \frac{7}{3}$

$\frac{7}{3}$ is an improper fraction.

**Let's convert $6\frac{2}{3}$ into improper fraction.**

$6\frac{2}{3} = \frac{(6\times3)+2}{3}$

$= \frac{18+2}{3}$

$= \frac{20}{3}$

So, $\frac{20}{3}$ is an improper fraction.

**Key Fact**

When we convert mixed number into improper fraction, its denominator does not change.

**Try Yourself**

Convert $4\frac{1}{4}$ into improper fraction.

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## Ordering of fractions

Ali, Usman and Kamal invest in a business. Ali's share is $\frac{2}{3}$, Usman's share is $\frac{1}{2}$ and Kamal's share is $\frac{1}{4}$. How will we write their shares in descending and ascending order?

To write in order, first we convert these fractions into like fractions by method of equivalent fraction.

$\frac{2}{3} = \frac{2\times4}{3\times4} = \frac{8}{12}$

$\frac{1}{2} = \frac{1\times6}{2\times6} = \frac{6}{12}$

$\frac{1}{4} = \frac{1\times3}{4\times3} = \frac{3}{12}$



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Now, we compare numerator of these fractions.
Numerators of these fractions are 8, 6 and 3.

$8 > 6$

So, $\frac{8}{12}$ is greater than $\frac{6}{12}$

$$\frac{8}{12} > \frac{6}{12}$$

$6 > 3$ so, $\frac{6}{12}$ is greater than $\frac{3}{12}$.

$$\frac{6}{12} > \frac{3}{12}$$

So, $\frac{8}{12} > \frac{6}{12} > \frac{3}{12}$

We can write these fractions in descending order.

$$\frac{8}{12}, \frac{6}{12}, \frac{3}{12}$$

We can write these fractions in ascending order.

$$\frac{3}{12}, \frac{6}{12}, \frac{8}{12}$$

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**Try It!**

I am a mixed number between 2 and 10. I am nearer to 8 than 4. If you separate my fractional part then I am an odd number. Who am i?_____

## Exercise 1

Encircle the unlike fractions of the following:

(a) $\frac{3}{5}, \frac{1}{2}$ (b) $\frac{7}{9}, \frac{4}{9}$ (c) $\frac{6}{11}, \frac{1}{11}$ (d) $\frac{2}{8}, \frac{3}{8}$ (e) $\frac{6}{10}, \frac{1}{5}$ (f) $\frac{5}{9}, \frac{2}{7}$

Make groups of students, give them flash cards of different fraction (improper and mixed number). Ask them to convert improper fractions into mixed number and vice versa.



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2. Compare the given fractions and write symbols of <, > or =

(a) $\frac{1}{2} \square \frac{3}{6}$ (b) $\frac{4}{5} \square \frac{9}{10}$ (c) $\frac{6}{12} \square \frac{3}{4}$ (d) $\frac{1}{7} \square$

(e) $\frac{2}{9} \square \frac{5}{6}$ (f) $\frac{8}{12} \square \frac{5}{7}$ (g) $\frac{1}{3} \square \frac{1}{4}$ (h) $\frac{4}{11} \square$

3. Write the following fractions into lowest form.

(a) $\frac{4}{20}$ (b) $\frac{2}{12}$ (c) $\frac{30}{45}$ (d) $\frac{9}{27}$

(f) $\frac{15}{25}$ (g) $\frac{16}{24}$ (h) $\frac{4}{18}$ (i) $\frac{14}{20}$

4. Encircle the proper fractions of the given and tick(✓) the mixed number.

(a) $\frac{2}{5}$ (b) $\frac{7}{8}$ (c) $\frac{3}{4}$ (d) $3\frac{4}{7}$

(f) $\frac{3}{8}$ (g) $\frac{9}{11}$ (h) $3\frac{7}{11}$ (i) $\frac{6}{7}$

5. Convert improper fractions into mixed number.

(a) $\frac{8}{5}$ (b) $\frac{11}{5}$ (c) $\frac{13}{10}$ (d) $\frac{20}{9}$

6. Convert mixed numbers into improper fraction.

(a) $2\frac{3}{5}$ (b) $7\frac{5}{6}$ (c) $4\frac{1}{7}$ (d) $5\frac{3}{11}$ $6\frac{1}{3}$

7. Write the given fractions in ascending and descending order.

(a) $\frac{3}{5}, \frac{3}{9}, \frac{3}{7}$ (b) $\frac{3}{4}, \frac{1}{3}, \frac{6}{7}$ (c) $\frac{3}{5}, \frac{2}{10}$

8. Ali have three full and one half pizza. How can we write this in mixed number?

9. Mahad buys $1\frac{1}{2}$ kg of mangoes. Write this in improper fraction.

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# Addition and Subtraction of Fractions

## Addition of Fractions

Shehzad walks $\frac{5}{7}$ km on Saturday and $\frac{2}{7}$ km on Sunday. How many kilometres does he walk in two days?

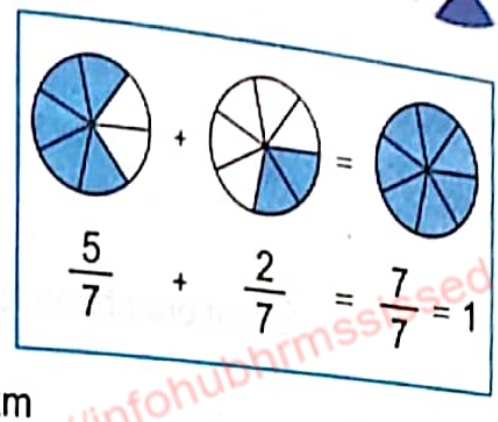
Add the fractions to find the total distance.

Walk on Saturday = $\frac{5}{7}$ km

Walk on Sunday = $\frac{2}{7}$ km

Walk in both days = $\frac{5}{7} + \frac{2}{7}$

$= \frac{5+2}{7} = \frac{7}{7} = 1$ km



$\frac{5}{7} + \frac{2}{7} = \frac{7}{7} = 1$

So, Shehzad walks 1 km in two days.

Add $\frac{5}{7}$, $\frac{1}{7}$ and $\frac{2}{7}$.

$\frac{5}{7}+\frac{1}{7}+\frac{2}{7} = \frac{5+1+2}{7}$

$= \frac{8}{7}$

$= 1\frac{1}{7}$

### Try Yourself

Add the following fractions:

(a) $\frac{3}{4} + \frac{1}{4}$ (b) $\frac{9}{10} + \frac{7}{10}$ (c) $\frac{3}{9} + \frac{7}{9}$

## Subtraction of Fractions

Faria buys $\frac{9}{10}$ m ribbon for her shirt and $\frac{7}{10}$ m ribbon for her scarf. How much more ribbon does she buy for the shirt?

Make groups of the students, ask them to write different fractions(with same denominators) in notebook and ask them to add these fractions.



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Ribbon for shirt = $\frac{9}{10}$ m

Ribbon for scarf = $\frac{7}{10}$ m

Difference = $\frac{9}{10} - \frac{7}{10}$

$= \frac{9-7}{10}$

$= \frac{2}{10}$ m

So, Faria buys $\frac{2}{10}$ m more ribbon for her shirt.

Subtract $\frac{4}{11}$ from $\frac{5}{11}$.

$\frac{5}{11} - \frac{4}{11} = \frac{5-4}{11}$

$= \frac{1}{11}$

## Try Yourself

Solve the following fractions:

(a) $\frac{5}{8} - \frac{3}{8}$ (b) $\frac{10}{11} - \frac{5}{11}$

(c) $\frac{7}{12} - \frac{5}{12}$

## Try It!

Maryam wants to make three kinds of biscuits. She needs $\frac{2}{7}$ cup of flour for first kind, $\frac{5}{7}$ cup of flour for the second and $\frac{3}{7}$ cup of flour for the third. How much flour will she need to make three kinds of biscuits?

TEACHING POINT

Make groups of the students, ask them to write different fractions (with same denominators) in notebook and ask them to subtract these fractions



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## Exercise 2

Solve the following fractions and write the answer in the lowest form.

(a) $\frac{6}{7} + \frac{5}{7}$

(b) $\frac{11}{13} + \frac{11}{13}$

(c) $\frac{5}{17} + \frac{11}{17}$

(d) $\frac{7}{15} + \frac{8}{15}$

(e) $\frac{5}{16} + \frac{5}{16}$

(f) $\frac{2}{19} + \frac{12}{19}$

Subtract the smallest fractions from the greatest fraction.

(a) $\frac{2}{3}, \frac{3}{3}$

(b) $\frac{1}{11}, \frac{7}{11}$

(c) $\frac{11}{12}, \frac{7}{12}$

(d) $\frac{7}{21}, \frac{15}{21}$

(e) $\frac{2}{5}, \frac{4}{5}$

(f) $\frac{8}{10}, \frac{4}{10}$

(g) $\frac{2}{13}, \frac{1}{13}$

(h) $\frac{5}{15}, \frac{3}{15}$

A painter paints $\frac{7}{13}$ part of the wall in first day and $\frac{3}{13}$ on the second day.

How much wall does he paint in two days?

On which day does he paint more?

$\frac{5}{7}$ kg of artificial fertilizer and $\frac{7}{14}$ kg of natural fertilizer have been used in a field. How much quantity of both fertilizers is used?

Saba did her math homework in $\frac{2}{10}$ hours and her sister did her math homework in $\frac{7}{10}$ hours. How many hours did both take to complete their homework?

Shiraz and Omar invest money in a business. Shiraz gets $\frac{7}{11}$ share and Omar gets $\frac{10}{11}$ share of the profit. Whose share is more and how much?

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# Multiplication of Fractions

## Multiplication of Fraction by a Whole Number

Government wants to construct 90 home in an area. $\frac{5}{6}$ of total homes are completed. How many homes are completed?

To find the number of constructed home, we have to multiply the fraction with total number of homes.

Total number of homes = 90

Constructed homes = $\frac{5}{6}$

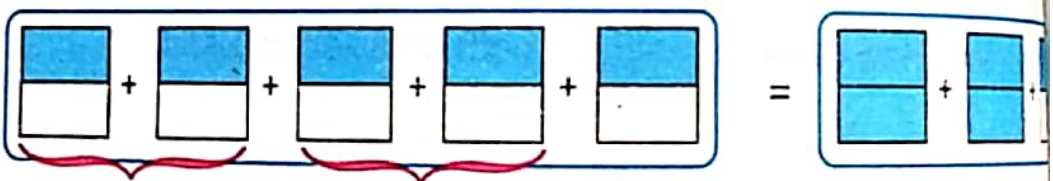
$= \frac{5}{6} \times 90$

$= \frac{5 \times \overset{15}{\cancel{90}}}{\underset{1}{\cancel{6}}}$

$= 75$

So, the government has constructed 75 homes.

Multiply 5 and $\frac{1}{2}$.



$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 1 + 1 +$

$5 \times \frac{1}{2} = \frac{1 \times 5}{2} = 2 + \frac{1}{2}$

$= \frac{5}{2} = 2\frac{1}{2}$

### Try Yourself

Multiply the following fracti whole numbers.

(a) $\frac{5}{8} \times 12$ (b) $\frac{5}{11} \times 22$ (c)

TEACHING POINT

Make groups of students, give them flash cards of different fractions ask them to multiply.



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Let's multiply $\frac{3}{4}$ and $\frac{5}{6}$.

$$\frac{3}{4} \times \frac{5}{6} = \frac{3 \times 5}{4 \times 6}$$

$$= \frac{15}{24}$$

Nadia has $6\frac{2}{3}$ kg of birds grain. Haris takes $\frac{3}{4}$ of it from Nadia. How many kilogram of grain does he take from Nadia?

To find, how much grain Haris takes from Nadia we have to multiply $6\frac{2}{3}$ and $\frac{3}{4}$.

$$6\frac{2}{3} \times \frac{3}{4} = \frac{20}{3} \times \frac{3}{4}$$

$$= \frac{20 \times 3}{3 \times 4}$$

$$= \frac{60}{12} = 5 \text{ kg}$$

So, Haris takes 5kg of grains from Nadia.

Let's multiply $4\frac{2}{5}$ with $5\frac{1}{2}$.

$$5\frac{1}{2} \times 4\frac{2}{5} = \frac{11}{2} \times \frac{22}{5}$$

$$= \frac{11 \times 22}{2 \times 5}$$

$$= \frac{\overset{121}{\cancel{242}}}{\underset{5}{\cancel{10}}}$$

$$= \frac{121}{5} = 24\frac{1}{5}$$

**Try Yourself**

When we multiply two mixed numbers, their product will always be a mixed number.



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# Division of Fraction by a Whole Number

Zaman drinks $35\frac{1}{2}$ litres of water in 10 days. How much water does he drink daily?

To find, how much water he drinks daily, we divide $35\frac{1}{2}$ by 10.

$$35\frac{1}{2} \div 10 = 35\frac{1}{2} \times \frac{1}{10}$$

Replace the division symbol by multiplication and 10 by $\frac{1}{10}$.

$$= \frac{71}{2} \times \frac{1}{10}$$

$$= \frac{71}{20}$$

$$= 3\frac{11}{20}\ \ell$$

So, Zaman drinks $3\frac{11}{20}$ litres of water daily.

Let's divide $\frac{3}{4}$ by 7.

$$\frac{3}{4} \div 7 = \frac{3}{4} \times \frac{1}{7}$$

$$= \frac{3 \times 1}{4 \times 7}$$

$$= \frac{3}{28}$$

**Try It!**

$\frac{4}{8}$ of 480 animals in the Zoo are rabbits and $\frac{1}{2}$ of them are white. Tell in fraction how many rabbits are white?

Make groups of students, give them flash cards of different fractions and whole numbers and ask them to divide these fractions by whole numbers



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## Exercise 3

1. Multiply the following:

(a) $\frac{6}{7}$, 4 (b) 9, $\frac{5}{6}$ (c) $\frac{13}{11}$, 11 (d) $\frac{8}{9}$, 6

(e) $\frac{1}{10}$, 2 (f) $\frac{6}{13}$, 1 (g) $\frac{7}{11}$, 2 (h) $3\frac{2}{3}$, 1

2. Solve the given fractions.

(a) $\frac{6}{2} \times \frac{3}{6}$ (b) $\frac{9}{11} \times \frac{5}{10}$ (c) $\frac{3}{17} \times 3\frac{3}{4}$ (d) $7\frac{1}{7} \times 1\frac{5}{8}$

(e) $\frac{2}{9} \times 1\frac{5}{6} \times \frac{5}{6}$ (f) $\frac{8}{12} \times 3\frac{8}{11} \times \frac{5}{7}$ (g) $\frac{4}{3} \times \frac{1}{4} \times 7\frac{7}{10}$

3. Solve the following:

(a) $\frac{7}{20} \div 2$ (b) $\frac{2}{15} \div 5$ (c) $\frac{20}{35} \div 9$ (d) $\frac{21}{27} \div 3$

(e) $\frac{14}{16} \div 7$ (f) $\frac{15}{20} \div 21$ (g) $\frac{18}{24} \div 3$ (h) $\frac{14}{18} \div 18$

4. If the weight of 5 packets of sugar is $4\frac{7}{8}$ kg, then what will be the weight of 1 packet of sugar?

5. Ayesha's age is $\frac{1}{2}$ of her sister's age. If her sister is 20 years old. How old is Ayesha?

6. Kamal will distribute $4\frac{1}{2}$ packets of candies among 6 children.
(a) How many packets of candies will each child get?
(b) If he distributes these packets among 9 children, then how many packets of candy will each child get?

7. The distance between Hamid's home and masjid is $2\frac{3}{4}$ kilometre. If Hamid goes to masjid to offer the Salah five times, then how much distance does he cover daily?

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## I have learnt to:

- recognize like and unlike fractions.
- compare two unlike fractions by converting into equivalent fractions with the same denominators.
- simplify fractions to the lowest form.
- identify (unit, proper, improper) fractions and mixed numbers / mixed fractions.
- convert improper fractions into mixed numbers / mixed fractions and vice versa.
- arrange fractions in ascending and descending order.
- add fractions with like denominators.
- subtract fractions with like denominators.
- multiply a fraction (proper, improper) and mixed number by a whole number.
- multiply two fractions (proper, improper) and mixed numbers / mixed fractions.
- divide a fraction (proper, improper) and mixed number / mixed fraction by a whole number.
- analyze real life situations involving fractions by identifying appropriate number operations.

**Vocabulary**

- Fractions
- Like Fractions
- Unlike Fractions
- Unit Fractions
- Common Factor
- Equivalent fractions
- Proper fractions
- Improper fractions
- Mixed Numbers / mixed fractions

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# Review Exercise

1. Tick (✓) the correct option.

(i) $\frac{5}{4}$ is an proper fraction.

(ii) $\frac{9}{7}$ (iii) $\frac{1}{2}$ (iv) $\frac{4}{2}$

(i) $\frac{5}{4}$ is an improper fraction.

(ii) $\frac{1}{2}$ (iii) $3\frac{5}{9}$ (iv) $\frac{4}{7}$

(i) $\frac{5}{4}$ is equal to.

(ii) $\frac{1}{4}+\frac{3}{4}$ (ii) $\frac{3}{4}$ (iii) 1 (iv) $\frac{2}{4}$

(i) $\frac{1}{4}$ is equal to.

(ii) $\frac{7}{6}-\frac{2}{6}$ (ii) $\frac{2}{6}$ (iii) $\frac{1}{6}$ (iv) $\frac{5}{6}$

(i) $\frac{9}{6}$

(v) The product of $\frac{7}{6}$ and 5 is _____.

(ii) $\frac{34}{7}$ (iii) $\frac{35}{7}$ (iv) $\frac{35}{6}$

(i) $\frac{34}{6}$

2. Tick (✓) the like fractions.

(a) $\frac{4}{9},\frac{1}{9},\frac{2}{9}$ (b) $\frac{5}{7},\frac{6}{11},\frac{2}{13}$ (c) $\frac{2}{17},\frac{9}{23},\frac{11}{12}$

(d) $\frac{6}{14},\frac{1}{14},\frac{2}{14}$ (e) $\frac{4}{13},\frac{1}{5},\frac{6}{7}$ (f) $\frac{3}{10},\frac{9}{10},\frac{1}{10}$

3. Compare the given fractions and write symbols of $<$ , $>$ or $=$.

(a) $\frac{9}{10}\square\frac{5}{7}$ (b) $\frac{6}{13}\square\frac{1}{12}$ (c) $\frac{3}{5}\square\frac{6}{11}$ (d) $\frac{8}{9}\square\frac{1}{2}$

4. Write the given fractions into the lowest form.

(a) $\frac{52}{18}$ (b) $\frac{17}{51}$ (c) $\frac{9}{19}$ (d) $\frac{22}{33}$

5. Encircle the unit fractions and tick (✓) the improper fractions.

(a) $\frac{9}{9}$ (b) $\frac{1}{6}$ (c) $\frac{7}{2}$ (d) $\frac{11}{5}$ (e) $\frac{1}{9}$

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6. Convert the improper fractions into mixed numbers.

(a) $\frac{7}{5}$ (b) $\frac{11}{8}$ (c) $\frac{17}{4}$ (d) $\frac{5}{4}$

7. Convert the mixed numbers into improper fractions.

(a) $1\frac{3}{5}$ (b) $3\frac{5}{10}$ (c) $6\frac{4}{7}$ (d) $2\frac{1}{9}$

8. Write the given fractions in ascending and descending order.

a) $\frac{4}{8}, \frac{5}{2}, \frac{6}{7}, \frac{1}{6}$ b) $\frac{2}{9}, \frac{8}{9}, \frac{5}{6}, \frac{1}{3}$ c) $\frac{4}{12}, \frac{7}{18}$

9. Add the given fractions.

(a) $\frac{1}{3}, \frac{2}{3}$ (b) $\frac{11}{12}, \frac{7}{12}$ (c) $\frac{9}{5}, \frac{4}{5}$ (d) $\frac{3}{9}$

10. Solve the given fractions.

(a) $\frac{9}{10} - \frac{3}{10}$ (b) $\frac{8}{13} - \frac{2}{13}$ (c) $\frac{6}{17} - \frac{1}{17}$ (d) $\frac{4}{7}$

11. Solve the given fractions.

(a) $\frac{9}{5} \times 7$ (b) $4\frac{2}{11} \times \frac{9}{10}$ (c) $\frac{1}{2} \times 7\frac{8}{9}$ (d) $3\frac{2}{11} \times 1$

(e) $1\frac{1}{4} \times 7\frac{3}{9}$ (f) $\frac{1}{6} \div 9$ (g) $4\frac{7}{12} \div 1$

12. In a garden $\frac{7}{12}$ of the trees are mango trees. In another garden of the trees are mango trees. How many mango trees are there altogether?

13. Hania has $12\frac{8}{14}$ m of ribbon. She wants to cut it into 8 equal pi What will be the length of each piece?

14. Jamal Reads $\frac{2}{7}$ of 140 pages of a book and Farhan reads 2 more pages than Jamal. How many pages does Farhan read?

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Unit 4

# Decimals

## Learning Outcomes

**After completing this unit, you will be able to:**

- Recognize a decimal number as an alternative way of writing a fraction.
- Express a decimal number as a fraction whose denominator is 10,100 or 1000.
- Identify and recognize the place value of a digit in decimals (up to 3-decimal places).
- Convert a given fraction into a decimal if:
  - Denominator of the fraction is 10,100 or 1000.
  - Denominator of the fraction is not 10,100 or 1000 but can be converted into 10, 100 or 1000.
- Convert a decimal (up to 3-decimal places) into fraction.
- Add and subtract 3-digit numbers (up to 2-decimal places).
- Multiply a 2-digit number (up to 1-decimal place) by 10,100, and 1000.
- Multiply a 2-digit number with 1-decimal place by a 1-digit number.
- Divide a 2-digit number with 1-decimal place by a 1-digit number
- Solve real life situations involving 2-digit numbers with 1-decimal place using appropriate operations.
- Round off a whole number to the nearest 10, 100, and 1000.
- Round off decimal (with 1 or 2-decimal places) to the nearest whole number.

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In our home, there is a pool. It covers $\frac{1}{100}$ of the house. What is another way of writing this fraction.



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# Decimal Numbers

## Tenths

There are mathematics books in 1 out of the 10 cupboards in the library. How can we write it in fraction?

There are mathematics books in 1 cupboard. We can write it as 1 out of 10 in a fraction like $\frac{1}{10}$

We can show this as:

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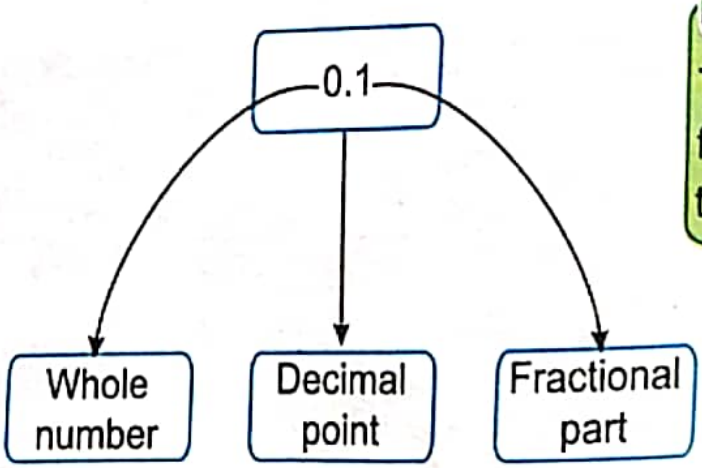
1 out of 10 parts = $\frac{1}{10}$ (Fraction)

= 0.1 (Decimal)

**Key Fact**

The word decimal com
from latin word decim
that means the tenth p



**Key Fact**

Decimal is a fract
with a denominato
10,100 and 1000

we can write it as 0.1 and read it 'zero point one'.



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...d at this shape.
...of 10 equal parts are coloured.
...write this in fraction as $\frac{3}{10}$

$\frac{3}{10} = 0.3$

...decimals, we write it as 0.3 and read 'zero point three'.

How do we express un-coloured parts in decimal?

...of 10 parts are not coloured in this figure.

We write it fraction as $\frac{7}{10}$.

...decimal fraction, we write it as 0.7 and read 'zero point seven'.

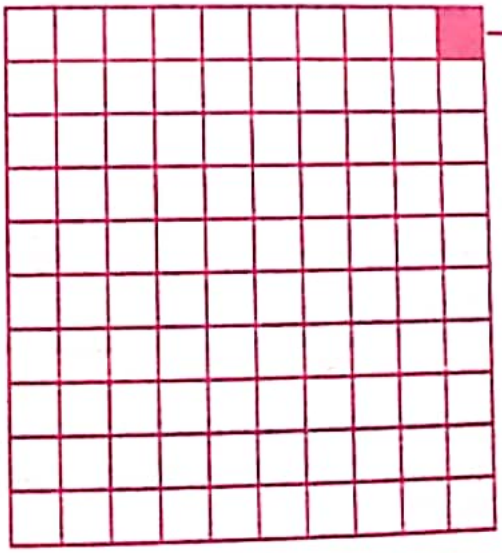
### ...ndredths

If we divide a square shape into 100 equal parts and colour one part then, how will we represent it in decimal fraction?

...out of 100 parts = $\frac{1}{100}$

...out of 100 parts = 0.01

...e can write it as 0.01 and ...ad 'zero point zero one'.



$\rightarrow \frac{1}{100} = 0.01$

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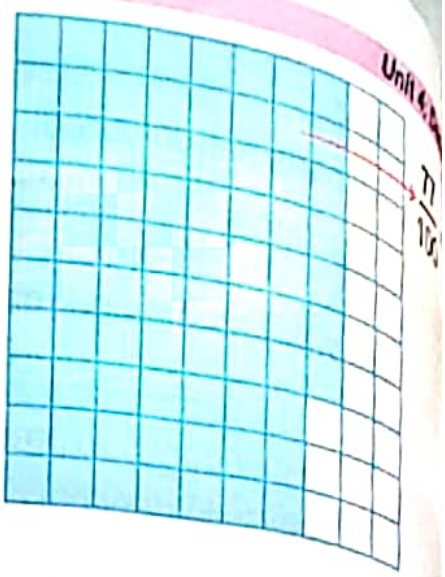
Look at this figure.



77 out of 100 equal parts are coloured.

We write this in fraction as $\frac{77}{100}$.

In decimals, we write it as 0.77 and read 'zero point seven seven'.

## Thousandths

If we divide a cube shape into 1000 equal parts and colour one part. How will we represent it in decimal?

**Try Yourself**

Ahmer solves 89 MC out of 100 in a test. W in decimal?

1 out of 1000 parts = $\frac{1}{1000}$

1 out of 1000 parts = 0.001

In decimals, we write it as 0.001and read 'zero point zero zero one'.

**Try Yourself**

Write the hundredth p one thousand in deci

## Place Value of Digits in Decimals

Hashim covers distance of 1.75 km to go from school to home daily. How can we represent this decimal in place value chart?

TEACHING POINT

Give squared shape flash cards to students and ask them to divide ea square into 10 equal parts. Students will colour some parts and repres it in decimal.



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...ics 4

...1 is a whole number and 75 is a fractional part. We read it as ...point seven five'. We represent it in place value chart as:

| | Decimal Point | Tenths | Hundredths |
|---|---|---|---|
| | . | 7 | 5 |

**Try Yourself**

Write 4 kg 987 g of wheat quantity in decimals and write place value of each digit.

What will be the value of each digit in the place value chart?

...value of each digit is represented by its ...on the place value chart as above.

...at ones place, the place value of 1 is

$$1 \times 1 = 1$$

...at tenths place, the place value of 7 is

$$7 \times 0.1 = 0.7$$

...at hundredths place, the place value of 5 is

$$5 \times 0.01 = 0.05$$

...will write it in expanded form as:

$$1.75 = 1 + \frac{7}{10} + \frac{5}{100}$$

$$1.75 = 1 + 0.7 + 0.05$$

**Key Fact**

In decimals value of each digit depends upon its place in the chart.

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...will we represent 21.304 in place value chart and what will be the ...e value of each digit?

...will represent 21.304 in place value chart as:

| Tens | Ones | . | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|
| 2 | 1 | . | 3 | 0 | 4 |

Give some flash cards with different digits and ask the students to make a number and stand in a row and tell the place value of each digits. Then ask the students to change their position and make a new number and repeat this with different numbers.



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We read it as 'twenty one point three zero four'.

The place and place value of each digit:

'2' is at tens place, the place value of 2 is:
$2 \times 10 = 20$

'1' is at ones place, the place value of 1 is:
$1 \times 1 = 1$

'3' is at tenths place, the place value of 3 is:
$3 \times 0.1 = 0.3$

'0' is at hundredths place, the place value of 0 is:
$0 \times 0.01 = 0.00$

'4' is at thousandths place, the place value of 4 is:
$4 \times 0.001 = 0.004$

Expanded form of 21.304 is:

$$21.304 = 20 + 1 + \frac{3}{10} + \frac{0}{100} + \frac{4}{1000}$$

$$21.304 = 20 + 1 + 0.3 + 0.00 + 0.004$$

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**Try It!** Challenge

Write the place value of each digit in 200.149 and express in expanded form.

## Exercise 1

1. Write the given fractions in decimals.

(a) $\frac{16}{100}$ (b) $\frac{1}{10}$ (c) $\frac{324}{1000}$ (d) $\frac{2}{100}$

2. Write the value of the coloured digits.

(a) 1.56 (b) 45.987 (c) 321.17

(e) 6.340 (f) 12.123 (g) 78.808



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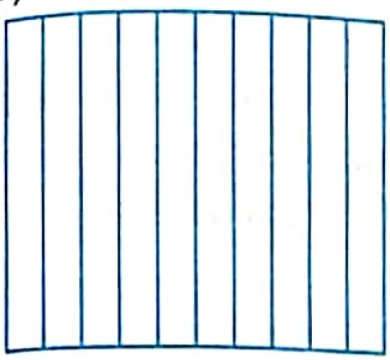
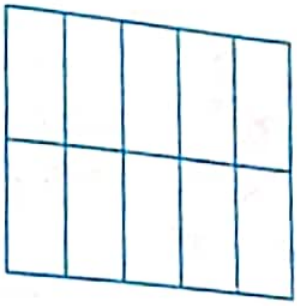
Colour the shapes with the help of the given decimals.

(a) 0.2

(b) 0.7



(c) 0.9



Fill in the blanks.

(a) 7.45

(i) '7' is at ones place, the place value of 7 is:
$7 \times ____ = ____$

(ii) '4' is at tenths place, the place value of 4 is:
$4 \times ____ = ____$

(iii) '5' is at hundredths place, the place value of 5 is:
$5 \times ____ = ____$

(c) 87.391

(i) '8' is at tens place, the place value of 8 is
$8 \times ____ = ____$

(ii) '7' is at ones place, the place value of 7 is:
$7 \times ____ = ____$

(iii) '3' is at tenths place, the place value of 3 is:
$3 \times ____ = ____$

(iv) '9' is at hundredths place, the place value of 9 is
$9 \times ____ = ____$

(v) '1' is in the thousandths place, the place value of 1 is:
$1 \times ____ = ____$

(b) 26.9

(i) '2' is at tens place, the place value of 2 is
$2 \times ____ = ____$

(ii) '6' is at ones place, the place value of 6 is:
$6 \times ____ = ____$

(iii) '9' is at tenths place, the place value of 9 is:
$9 \times ____ = ____$

(d) 99.999

(i) '9' is at tens place, the place value of 9 is:
$9 \times ____ = ____$

(ii) '9' is at ones place, the place value of 9 is:
$9 \times ____ = ____$

(iii) '9' is at tenths place, the place value of 9 is
$9 \times ____ = ____$

(iv) '9' is at hundredths place, the place value of 9 is:
$9 \times ____ = ____$

(v) '9' is at thousandths place, the place value of 9 is:
$9 \times ____ = ____$

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# Conversion of Fractions and Decimals

## Conversion of fraction to decimals

In the science practical exam, 38 out of 100 the students are working on the light experiment. Write it in fraction then convert into the decimal.

38 students out of 100 = $\frac{38}{100}$

Convert $\frac{38}{100}$ into decimals.

As, there are 2 zeros after 1 in denominator of $\frac{38}{100}$.

We will count in numerator, 2 digits from right to left and put decimal point before it.

$$\frac{38}{100} = 0.38$$

$$\begin{array}{r} 0.38 \\ 100\overline{)380} \\ 300 \\ \hline 800 \\ 800 \\ \hline 0 \end{array}$$

**Key Fact**

To convert fractions with denominator of 10,100 or 1
- Count the number of ze in the denominator.
- Count the digit in the numerator from right to le
- Put the decimal point according to the number zeros.

Amar has Rs 1000. He buys a toy for Rs 299. Write the amount spent by Amar in decimals.

299 out of 1000 = $\frac{299}{1000}$

Convert $\frac{299}{1000}$ into decimals.

There are 3 zeros after 1 in denominator of $\frac{299}{1000}$.

We will count 3 digits from right to left in numerator and put decimal point before it.

$$\frac{299}{1000} = 0.299$$

**Try Yourself**

About 95 out of 1 patients were recovering from the corona virus in Pakistan. Write it in decimal?

**TEACHER'S POINT**

Write fractions with denominator of 10, 100 and 1000 on the writing board and convert into decimals. Ask the students to explain the method of conversion.

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Asad's teacher divided the students in groups of 5. 2 out of 5 students who participated in a game. Write it in decimal.

Fraction of students participated in a game = $\frac{2}{5}$

In fraction, $\frac{2}{5}$, the denominator is not 10, 100 or 1000. Therefore, we will convert $\frac{2}{5}$ into an equivalent fraction with the denominator of 10.

Convert $\frac{2}{5}$ into equivalent fraction.

$$\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$$

Convert $\frac{4}{10}$ into decimal.

$$\frac{4}{10} = 0.4$$

Therefore, 0.4 students participated in a game from each group.

Convert $\frac{4}{25}$ into decimal.

Convert $\frac{4}{25}$ into equivalent fraction whose denominator is 100

$$\frac{4}{25} = \frac{4 \times 4}{25 \times 4} = \frac{16}{100}$$

Convert $\frac{16}{100}$ into decimal.

$$\frac{16}{100} = 0.16$$

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## Conversion of decimals to fractions

The height of an elephant is 3.2 m. Write it as fraction.

To find the height of the elephant in fraction, remove decimal point, place 1 at the decimal point in denominator, then count the digits after the decimal point which is 1, then put one zero (0) at the right side of 1 in the denominator.

$$3.2 = \frac{32}{10}$$

**Try Yourself**

The highest temperature of Multan is 44.1°C. What will be this temperature in fraction?

**Convert 5.234 into fraction.**

To convert 5.234 into fraction, remove the decimal point, we write 1 at the place of decimal point and put 3 zeros after 1, because of there is 3-digit at the right side of the decimal point.

$$5.234 = \frac{5234}{1000}$$

**Key Fact**

Decimal number is also known as decimal fraction.

**Try It!** Challenge

Show 7.74 in the place value chart and convert 7.74 into fraction.

Write some decimal fractions on the writing board. Ask the students to convert decimal fraction into fraction and also tell the method of conversion.



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## Exercise 2

1. Represent these in decimal fraction.

(a) $\frac{24}{100}$ (b) $\frac{5}{1000}$ (c) $\frac{6}{10}$ (d) $\frac{12}{500}$ (e) $\frac{3}{250}$

(f) $\frac{47}{25}$ (g) $\frac{60}{200}$ (h) $\frac{606}{1000}$ (i) $\frac{80}{1000}$ (j) $\frac{1}{50}$

2. Convert the following decimal fractions into fraction.

(a) 1.3 (b) 2.04 (c) 6.98 (d) 5.5 (e) 0.68

(f) 21.72 (g) 7.87 (h) 0.98 (i) 11.11 (j) 6.10

# Addition and Subtraction of Decimals

## Addition of Decimals

There are 0.45 units of minerals and 0.25 units of water in soil. What will be the quantity of both altogether?

To find out the quantity of both things in soil, we will have to add both quantities.

| | Ones | · | tenths | hundredths |
|---|---|---|---|---|
| The quantity of mineral in soil = | 0 | · | 4 (1) | 5 |
| The quantity of water in soil = | + 0 | · | 2 | 5 |
| Total quantity minerals in soil = | 0 | · | 7 | 0 |

The total quantity of water and minerals in soil will be 0.70 units.

Make groups of students, ask them to write some decimal numbers in their notebook and then add.



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**Key Fact**

To add the decimals, always write the value at the same place in a column. Add ones in ones, tenths in tenths and hundredths in hundredths.

**Try Yourself**

Ali has 2.98 kg of sugar and 1.09 kg of rice. How much total amount of sugar and rice will he have?

## Subtraction of Decimals

The temperature of Karachi in January is 20.8°C and in June is 40.1°C. Which month is colder and by how much degrees?

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To find the difference between two months, we will subtract the temperatures.

| | | tens | ones | . | tenths |
|---|---|---|---|---|---|
| Temperature in June | = | $^{3}\cancel{4}^{\prime}$ | $^{9}\cancel{1}0$ | . | $^{10}1$ |
| Temperature in January | = | − 2 | 0 | . | 8 |
| Difference between both months | = | 1 | 9 | . | 3 |

So, January is 19.3°C colder than June.



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**Key Fact**

To subtract the decimals, always write the decimals at the same place in a column. Then subtract ones from ones, tenths from tenths and hundredths from hundredths.

**Key Fact**

Always subtract smaller decimal number from the greater decimal number.

**Try It! Challenge**

The sum of two decimals is 12.8, find the first decimal fraction if the second decimal fraction is 7.9. What do we add in 12.8 to get 25.8?

**Try Yourself**

Sara has two ribbons. The length of one ribbon is 42.9 cm and the other is 56.8 cm. What is the difference between their lengths?

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## Exercise 3

Add the following:

(a) 9.11, 8.03 (b) 43.1, 12.7 (c) 52.9 , 2.2

(d) 5.69, 2.98 (e) 6.02 , 1.89 (f) 49.3 , 21.6

Solve the following:

(a) 4.91 – 3.92 (b) 7.34 – 2.86 (c) 5.06 – 2.76

(d) 7.88 – 6.19 (e) 9.80 – 1.09 (f) 78.9 – 7.84

Zubair bought a chocolate for Rs 45.7 and a candy for Rs 10.2. How much amount did he spend altogether?

The mass of apples is 38.9 kg and mass of guava is 42.6 kg.

(a) Find the difference between mass of apples and guavas.

(b) Find the total mass.

Teacher will write 3-digit decimal number (up to 2-decimal places) on the writing board. Students explain the method of subtraction.



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# Multiplication and Division of Decimals

## Multiplication of Decimals with 10, 100 or 1000

The length of grain of a rice is 0.9 cm. If Sameer has 10, 100 and1000 such grains of rice. How will we calculate the total length?

To find the length of such10, 100 and 1000 grains of rice, we will multiply the length of grains of rice by 10, 100 and 1000 respectively.

The total length of 10 grains of rice is = $0.9 \times 10$

$$= \frac{9}{10} \times 10 = 9\text{cm}$$

The total length of 100 grains of rice is = $0.9 \times 100$

$$= \frac{9}{10} \times 100 = 90\text{cm}$$

The total length of 1000 grains of rice is = $0.9 \times 1000$

$$= \frac{9}{10} \times 1000 = 900\text{cm}$$

**Key Fact**

- To multiply any decimal number by 10, we move the decimal point 1 place to the right.
- To multiply the decimal number by 100, we move the decimal point 2 places to the right.
- To multiply decimal number by 1000, we move the decimal point 3 places to the right.



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# Division of Decimals

## Division of Decimals by Whole Numbers

Komal divides 6.6 kg apples in 3 baskets. How many kilograms of apples are there in each basket?

To find how many kilograms of apple in each basket, we will divide 6.6 by 3.

Total apples = 6.6kg

Total baskets = 3

Apples in each basket = 6.6 ÷ 3 = 2.2kg

So, there are 2.2kg apples in each basket.

```
   2.2
3 | 6.6
  - 6
  ---
    06
  -  6
  ---
     0
```

Maham has 9.5m ribbon. If she divides it into 5 equal pieces, then find the length of each piece.

Length of ribbon = 9.5m

Total pieces = 5

Length of one piece = 9.5 ÷ 5 = 1.9m

So, the length of each piece of ribbon will be 1.9m.

```
   1.9
5 | 9.5
  - 5
  ---
    45
  - 45
  ---
     0
```

### Try Yourself

Divide 2.8 by 4.

### Try It!

Write decimals with one decimal place which when divides by 4 will give 1.2, 0.2 and

Ask the students to write decimals with 1-decimal place and divide by 1-digit number.



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## Exercise 4

Solve the following:

(a) $5.9 \times 10$ (b) $4.8 \times 100$ (c) $0.3 \times 1000$

(d) $8.2 \times 10$ (e) $4.3 \times 1000$ (f) $9.1 \times 100$

Solve the following:

(a) $5.6 \times 8$ (b) $7.1 \times 2$ (c) $4.9 \times 4$

(d) $3.4 \times 3$ (e) $1.3 \times 7$ (f) $9.8 \times 9$

Solve the following:

(a) $1.4 \div 2$ (b) $1.8 \div 9$ (c) $6.4 \div 4$

(d) $8.4 \div 6$ (e) $2.7 \div 3$ (f) $2.6 \div 2$

Saba uses 9.8 mℓ of oil to bake a cake. How much oil will she use to bake 10 such cakes?

A tailor uses 2.5 m cloth to make a shirt. How much cloth will he use to make 8 similar shirts?

The length of one piece of rope is 7.2 m. Iram cuts this rope into 4 equal pieces.

(a) What will be the length of each piece?

(b) If she will cut the rope into 2 equal pieces. What will be the length of each piece?

Ahmad solves 5 questions of Mathematics in 8.5 minutes. How long does he take to solve 1 question?

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## Estimation

### Round off whole numbers to the nearest 10, 100 or 1000

In a garden, there are 5271 mango trees. How can we round off the number of trees to the nearest 10, 100 and 1000?

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We follow some rules to round off any number to the nearest 10, 100 and 1000.

### While rounding off to the nearest 10:

- If the digit at ones place is less than 5, then the digit at ones place is replaced by "0".

  So, $43 \approx 40$

- If the digit at ones place is equal to 5 or greater than 5, then the digit at ones place is replaced by "0" and the digit at tens place is increased by "1".

  So, $58 \approx 60$

### While rounding off to the nearest 100:

- If the digit at tens place is less than 5, then the digit at tens and ones places are replaced by "0".

  So, $523 \approx 500$

- If the digit at tens place is equal to 5 or greater than 5, then the digit at tens and ones places are replaced by "0" and the digit at hundreds place is increased by "1".

  So, $879 \approx 900$

### While rounding off to the nearest 1000:

- If the digit at hundreds place is less than 5, then the digit at hundreds, tens and ones places are replaced by "0".

  So, $1324 \approx 1000$

- If the digit at hundreds place is equal to 5 or greater than 5, then the digit at hundreds, tens and ones places are replaced by "0" and the digit at thousands place is increased by "1".

  So, $4508 \approx 5000$

Write some whole numbers on the board and explain the method of rounding off numbers to nearest whole number. Ask the students to round off these numbers to the nearest 10, 100 and 1000.

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**Try Yourself**

Write 6789 by rounding off to the nearest 10, 100 and 1000.

## ...d off decimals to the nearest Whole Number

Children spend approximately 1.7 hours in practical work of Science. How can we round off this time to the nearest whole number?

We follow same rules to round off any decimals to the nearest whole number.

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While rounding off decimals to the nearest whole number:

- If the digit at the right side of the decimal point is less than 5, then write the digit at the ones place as it is and remove the decimal point and the digit at tenth place.
- If the digit at the right side of the decimal point is equal to 5 or greater than 5, then add "1" to the digit at ones place and remove the decimal point and the digit at tenth place.

...7, the digit after the decimal point is greater than 5 so, we add 1 to ...git at the ones place.

So, $1.7 \approx 2$

Write some decimals on the writing board and explain the method of rounding off decimals to the nearest whole number.



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**Let's round off 2.45 to the nearest whole number.**

As, in 2.45 the digit right of the decimal point is less than 5 so,

So, $2.45 \approx 2$

**Key Fact**

Estimation means to find a number that is nearest to the orignal number but not exact.

Try It!

Write 3 decimals which can be rounded off to 68.

## Exercise 5

1. Round off the following whole numbers to the nearest 10, 100 and 1000:

   (a) 9871 (b) 5467

   (c) 1212 (d) 6343

   (e) 5555 (f) 3498

   (g) 1289 (h) 4545

   (i) 1111

2. Round off the following decimal fractions to the nearest whole number:

   (a) 5.61 (b) 54.2

   (c) 987.4 (d) 12.7

   (e) 8.98 (f) 6.5

   (g) 76.49 (h) 8.19

   (i) 87.87

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## Try It! Challenge

Write pairs of 3-digit decimals up to 2-decimal places whose product is 1, 2 and 3 decimal places respectively. Verify your answer.

## I have learnt to:

- recognize a decimal number as an alternative way of writing a fraction.
- express a decimal number as a fraction whose denominator is 10, 100 or 1000.
- identify and recognize the place value of a digit in decimals (up to 3-decimal places).
- convert a given fraction into a decimal if:
  - denominator of the fraction is 10,100 or 1000.
  - denominator of the fraction is not 10, 100 or 1000 but can be converted into 10, 100 or 1000.
- convert a decimal (up to 3-decimal places) into fraction.
- add and subtract 3-digit numbers (up to 2-decimal places).
- multiply a 2-digit number (up to 1 decimal place) by 10, 100, and 1000.
- multiply a 2-digit number with 1-decimal place by a 1-digit number.
- divide a 2-digit number with 1-decimal place by a 1-digit number
- solve real life situations involving 2-digit numbers with 1-decimal place using appropriate operations.
- round off a whole number to the nearest 10, 100, and 1000.
- round off decimal (with 1 or 2-decimal places) to the nearest whole number.

### Vocabulary

- Fractions
- Decimals
- Denominator
- Tenths
- Hundredths
- Whole Numbers
- Round Off
- Decimal Places
- Thousandths

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# Review Exercise

1. Tick (✓) the correct option.

(a) Decimal is a fraction with the denominator is power of

(i) 10 (ii) 2 (iii) 15 (iv) 0

(b) When we divide a shape into 10 equal parts, then each part is called _____.

(i) hundredths (ii) tenths (iii) one (iv) half

(c) To add the decimals always _____ ones in ones, tenths in tenths and hundreds in hundredths.

(i) add (ii) subtract (iii) multiply (iv) divide

(d) When we multiply any decimal by 100, we move the decimal _____ place to the right.

(i) 1 (ii) 2 (iii) 3 (iv) 0

(e) _____means to find a number that is nearest to the original number but not exact.

(i) decimal (ii) Fraction (iii) round off (iv) Estimation

2. Represent the following in decimals:

(a) $\frac{17}{100}$ (b) $\frac{15}{200}$ (c) $\frac{4}{20}$ (d) $\frac{19}{100}$ (e) $\frac{3}{5}$

3. Convert the following decimals into fractions:

(a) 6.7 (b) 45.56 (c) 1.02 (d) 7.87 (e) 15.1

4. Add the following:

(a) 6.03, 5.56 (b) 8.28 , 1.24 (c) 12.8 , 3.4

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Exercise 4

Solve the following:

a) 7.59 – 2.48 (b) 6.19 – 4.21 (c) 5.06 – 1.09

Solve the following:

a) 1.3 ×10 (b) 8.9 × 100 (c) 4.5 ×1000
d) 8.2 × 7 (e) 9.3 × 3 (f) 7.1 × 6

Solve the following:

a) 6.8 ÷ 4 (b) 8.8 ÷ 2 (c) 8.1 ÷ 9
d) 3.5 ÷ 7 (e) 4.8 ÷ 6 (f) 5.1 ÷ 3

Round off the whole number to the nearest 10, 100 and 1000.

a) 3429 (b) 1009 (c) 7824
d) 8417 (e) 4090 (f) 1717

Round off the decimals to the nearest whole number.

a) 4.17 (b) 78.3 (c) 13.45
d) 0.98 (e) 41.41 (f) 9.82

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The length of a wire is 3.41 m and length of another wire is 7.56 m.

a) What will be the total length?
b) What is the difference between the lengths of the two wires?

The capacity of a pack of juice is 3.4 litre.

a) What will be the capacity of such 7 packs?
b) If the capacity of a pack of juice is 2.8 litre, what will be the capacity of 5 such packs?

The mass of 4 boxes of pencils is 1.8 kg. What will be the mass of 1 box?



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# Unit 5 Measurement

## Learning Outcomes

**After completing this unit, you will be able to:**

- Use standard metric units to measure the length of different objects.
- Convert larger into smaller metric units (2-digit numbers with one decimal place)
  - kilometres into metres
  - metres into centimetres
  - centimetres into millimetres
- Add and subtract measures of length in same units.
- Use standard metric units to measure the mass of different objects.
- Convert larger into smaller metric units (2-digit numbers with one decimal place)
  - kilograms into grams
  - grams into milligrams
- Add and subtract measures of mass in same units.
- Use standard metric units to measure the capacity of different containers.
- Convert larger into smaller metric units (2-digit numbers with one decimal place) litres into millilitres.
- Add and subtract measure of capacity in same units.
- Solve real life situations involving conversion, addition and subtraction of measures of length, mass and capacity.

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Faiq visits a seaside with his friends. There they see a tortoise and a seahorse. Which animal is taller and heavier?



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# Length

Fawaz wants to know the length of his classroom. How will he measure its length?

To measure the length of classroom, we will use measuring tape.

We measure the length of short objects(book, table, geometry box) in centimetres and the length of long objects in metres.

How can we measure the distance between two places?

We will use the unit of kilometre to measure the distance between two places. These units of length are closely related to each other.

1cm = 10 mm

1m = 100 cm

1km = 1000 m

## Conversion of units of Length

### Kilometres to Metres

The distance between the first and last station of Lahore Metro Bus is 27 km. How will we find this distance in metres?

Give flash cards of objects (ribbons, ropes) with different length to students. Ask them to separate the objects according to their unit of length.



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To find this distance in metre, we will multiply 27 by 1000.

Key Fa
1km = 100

Convert 27 km into metre.

$27km = 27 \times 1000m$

$= 27000m$

To convert 45km 7 metre. First conv 45km into metre b add 7m in it.

**Convert 45km 7m into metre.**

$45km\ 7m = 45km + 7m$

$= 45 \times 1000m + 7m$

$= 45000m + 7m$

$= 45007m$

**Try Yourself**

The distance between Masjid and Damen Koh 7.7 km. Convert this distance into metres?

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## Conversion of Metres to Cenitmetres

The height of Wall of China is 7 m approxmately. What will be its height in centimetre?

Key Fa
1m = 100cm

To find the height of Wall of China in centimetre, we will multiply 7 m by 100.

Let's convert 7 m into centimetre.

$7\ m = 7 \times 100\ cm$

$= 700\ cm$

TEACHING POINT

Students will write some distances in kilometre on the writing board a convert these into metre.



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...rt 13 m 38 cm into centimetre.

To convert 13m 38cm into centimetre. First convert 13 m into cm then add 38cm in it.

$$13\text{m } 38\text{cm} = 13\text{m} + 38\text{cm}$$
$$= 13 \times 100\text{cm} + 38\text{cm}$$
$$= 1300\text{cm} + 38\text{cm}$$
$$= 1338\text{cm}$$

**Try Yourself**

...gth of whale is ...25m. What will be ...gth in centimetre?

## ...rsion of Cenitmetres to Millimetres

Tania has a 78 cm long toy car. What will be its length in millimetre?

Multiply by 10 to convert cm into mm.

$$78\text{cm} = 78 \times 10\text{mm}$$
$$= 780\text{mm}$$

The length of toy car will be 780mm.

**Key Fact**

1cm = 10mm

...vert 56cm 7mm into mm.

To convert 56cm 7mm into mm first we convert 56cm into mm and then add 7mm in it.

...m 7mm = 56cm + 7mm
= 56 × 10mm + 7mm
= 560mm + 7mm
= 567mm

**Try Yourself**

- Ahmad buys a bag. The length of bag is 42cm. What will be the length of bag in mm?
- If the length of alligator is 4.1m, then what will be its length in cm?

Students will write some distances in metres on the writing board and convert into centimetres.



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## Exercise 1

1. Tick (✓) the correct units of length.

(a)

m / cm

(b)

mm / cm

(c)

m / cm

(d)

2. Convert these units of length.

(a) 12 km into m
(b) 56 km 930 m into m
(c) 88 m into cm
(d) 60 m 78 cm into cm
(e) 3.2 cm into mm
(f) 55 cm 2 mm

### Addition and Subtraction in Units of Length

The distance between Faiza's home and her office is 2km 600m and distance between her office and market is 3 km 200 m. What will be the distance between her home to market?

To find the distance between Faiza's home and market, we will add the distance between them.

| | | |
|---|---|---|
| Distance between home and office | = | 2km 600m |
| Distance between office to market | = + | 3km 200m |
| Distance between home and market | = | 5km 800m |

The distance between Faiza's home to market will be 5 km 80



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...convert this distance into metres we will convert 5 km into ... and add 800m in it.

$5km + 800m = 5km + 800m$

$= 5 \times 1000m + 800m$

$= 5000m + 800m$

$= 5800m$

...distance between Faiza's home and market will be = 5800m

The height of the minaret of Faisal Masjid is 90m and the height of the minaret of Badshahi Masjid is 60m. What is the difference between the height of two minarets?

To find the difference between the height of two minarets, we will subtract their heights.

...tract 60 m from 90 m.

...eight of minaret of Faisal Masjid = 90m

...eight of minaret of Badshahi Masjid = – 60m

...fference between the heights = 30m

∴

**Key Fact**

- To add/subtract the units of length, alwasys add/subtract same units.
- Add/subtract km into km, m into m, cm into cm and mm into mm.

...difference between the height of minarets of Faisal Masjid and ...dshahi Masjid is 30m.

Give ribbons of different lengths to students. Ask them to measure the length of these ribbons. Add and subtract the lengths.



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## Exercise 2

1. Solve the given units of length.

   (a) 22km + 33km

   (b) 88km + 6km 17m

   (c) 82m + 22m

   (d) 71cm 2mm + 11cm

   (e) 21m 16cm + 20m 14cm

   (f) 74km 122m + 13m

2. Solve the given units of length.

   (a) 99km – 74km

   (b) 52km 48m – 6km

   (c) 47m – 10m

   (d) 35cm 5mm – 25cm

   (e) 21m 16cm – 20m 14cm

   (f) 74km 122m – 13m

3. Tahir has two pieces of rope. The length of one piece is 38m and length of the other piece is 61m 12cm. What will be the total length?

4. Ahmad buys 140cm ribbon to warp the gift box. Convert the length into millimeters?

5. Kamal covers distance of 2km 712m to go from school to home and covers distance of 1km 216m to go from home to masjid.

   (a) Find the difference between the distances.

   (b) Convert the difference into metres.

6. The length of Ahmad's room is 5m 56cm and his sister's room is 4m 44cm.

   (a) What will be the total length of both rooms in cm?

   (b) What is the difference between the length of both rooms?

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# Mass

Wajid bought a computer table. He wants to find the mass of his table. Which unit will he use to find its mass?

He will use the unit of kilogram to find the mass of the computer table.

**Key Fact**

We use grams to measure the mass of light objects.
We use kilogram to measure the mass of heavy objects.
We use milligram to measure the mass of small objects like beads, grain of wheat or medicines.

We want to find the mass of an elephant. Which unit will we use to find its mass?

To find the mass of an elephant, we will use kilograms. These units of mass are closely related to each other.

1kg= 1000g

1g= 1000mg

Show objects of different masses to students and ask them to sort out the objects according to the units of mass.



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# Conversion of units of Mass

## Conversion of Kilograms to Grams

The mass of the human brain is 1.5kg. What will be the mass of brain in grams?

**Key Fact**

1kg = 1000g

To find the mass of brain in grams, we multiply 1.5kg by 1000.

$$1.5kg = 1.5 \times 1000g$$

$$= \frac{15}{10} \times 1000g = 1500g$$

*The mass of brain is 1500 grams.*

**Try Yourself**

The mass of a water melon is 3kg. What will be its mass in grams?

**Convert 60kg 234g into grams.**

To convert 60kg 234g into grams, first convert 60kg into grams and then add 234g in it.

$$60kg\ 234g = 60kg + 234g$$

$$= 60 \times 1000g + 234g$$

$$= 60000g + 234g$$

$$= 60234g$$

The students will write mass of some objects in kilograms on the board and convert into grams.

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## ...version of Grams to Milligrams

Umar buys 500g rice. What will be the mass of rice in milligrams?

We multiply 500g by 1000 to convert grams into milligrams.

$$500g = 500 \times 1000mg$$
$$= 500000mg$$

Let's convert 45g 12mg into mg.

To convert 45g 12mg into mg first convert 45g into milligrams and then add 12mg in it.

$$45g\ 12mg = 45g + 12mg$$
$$= 45 \times 1000mg + 12mg$$
$$= 45000mg + 12mg$$
$$= 45012mg$$

### Try Yourself

...e mass of human ...art is 230g. What will ...e the mass of heart in ...rams?

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### Try It!

...e mass of the bulb is 12mg and mass of tube light is 25g. Tell how ...uch tube light is heavier in milligrams than bulb?

To remind the students write some mass in grams on the board and ask them to convert these into milligram.



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# Addition and Subtraction of Units of Mass

## Addition of Units of Mass

Amar has a bag of coins whose mass is 5 kg 600 g. Imran has a bag of coins of mass 2 kg 200 g. What will be the mass of both bags in grams?

To find the total mass of both, we have to add the mass of both bags.

| | | | |
|---|---|---|---|
| The mass of Amar's bag | = | 5kg | 600g |
| The mass of Imran's bag | = + | 2kg | 200g |
| The mass of both bags | = | 7kg | 800g |

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So, the mass of both bags is 7 kg 800g. Now to convert it into grams we convert 7 kg into grams and then add 800g in it.

7kg 800g = 7kg + 800g

= 7 × 1000g + 800g

= 7000g + 800g

= 7800g

**Key Fact**

To add the units of mass always add the same units. Add kg into kg, g into g and mg into mg.

So, the mass of both bags is 7800g.



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## ...version of Units of Mass

Asma bakes a cake. Its mass is 500 g and Shazia bakes a cake. Its mass is 750 g. What is the difference between the mass of the two cakes?

To find the difference between the masses of two cakes, we will subtract.

Mass of Shazia' s cake = 750g
Mass of Asma's cake = – 500g
Difference between the masses = 250g

...ference between the mass of the two ...s is 250g.

**Try It!** Challenge

The mass of two boxes is 6.9 kg. if the mass of one box is 4.5 kg, then what will be the mass of the other box?

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## Exercise 3

Convert the following units of mass:

(a) 65 kg into g
(b) 23 kg 139 g into g
(c) 89g into mg
(d) 43 g 699 mg into mg
(e) 1.9 g into mg
(f) 0.8 kg into g

Solve the following:

(a) 36kg + 76kg
(b) 18kg + 17kg 17g
(d) 8.2g + 2.2g
(e) 71g 2mg + 11g 560mg
(e) 21g 16mg + 60g 14mg
(f) 94kg 122g + 23g

Give some flashcards with different masses to the students. Ask them to add and subtract the masses and convert the units.



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3. Solve the following:

(a) 99kg – 24kg

(b) 58kg 458g – 29kg 9

(c) 904g – 154g

(d) 39g 500mg – 25g 1

4. Usman has two fish in a jar. The mass of one fish is 29g 20mg and the mass of the other is 20g 14mg. What is the difference between the mass of the two fish in mg?

5. A shopkeeper sells 49kg 208g of sugar and 65kg 750g of flour. Find the total quantity of sugar and flour in grams?

6. Jamal weighs 67kg 278g and his father weighs 89kg 924g.

(a) What is the difference between their masses?

(b) Convert the difference between their masses into grams.

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## Capacity

Waleed has a water bottle. He wants to find out the capacity of the water bottle. How will he find the capacity?

To find the capacity of the water bottle, we use the unit of litre.

Make two groups of students and give them containers with different capacities and ask them to seperate the containers according to units of capacity.



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millilitre to measure the capacity of small containers (glass, we use the unit of litre to measure the capacity of large

If we want to find the capacity of a tub, then how will we find its capacity?

use the unit of litre to find the capacity of a tub. The units of city are closely related to each other.

$1\ell = 1000m\ell$

## Conversion of units of capacity

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### to Millilitres

Minahil drinks 3 litres of water in a day. How many millilitres of water does she drink in a day?

o convert litres into illilitres, we multiply tres by 1000.

$3\ell = 3 \times 1000m\ell = 3000m\ell$

Minahil drinks $3000m\ell$ of water in a day.

The students are given some flash cards with units of litres. They are asked to convert litre into millilitre.



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**Convert 10ℓ 345 mℓ into mℓ.**

**Try Yourself**

In a human body the quantity of water is 42ℓ. Convert this quantity into mℓ.

To convert 10ℓ 345 mℓ into mℓ, first convert 10ℓ into mℓ and then add 345 mℓ in it.

$$10\ell\ 345m\ell = 10\ell + 345m\ell$$
$$= 10 \times 1000m\ell + 345m\ell$$
$$= 10000m\ell + 345m\ell$$
$$= 10345m\ell$$

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## Exercise 4

1. Convert the following units of capacities:

(a) 9ℓ into mℓ
(b) 74ℓ into mℓ
(c) 56ℓ into mℓ
(d) 90ℓ into mℓ
(e) 67ℓ into mℓ
(f) 1.6ℓ into mℓ

2. The capacity of an oil tanker is 98ℓ. Convert it into millilitres.

3. Faria uses 1.7 litres of milk to make milkshake. Convert the quantity of milk into millilitres.



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## ...ction and Subtraction in Units of capacity

Maryam uses 56mℓ of oil to make a pizza and 78mℓ of oil to make biscuits. How much millilitres of oil does she use to make both things?

...find the total quantity of oil used in both things, we ...add the quantity of both.

| | | |
|---|---|---|
| The quantity of oil used to make pizza | = | 56mℓ |
| The quantity of oil used to make biscuits | = | + 78mℓ |
| Total quantity of oil used in both things | = | 134mℓ |

...Maryam uses 134mℓ of oil in both things.

...2ℓ and 7.6ℓ and convert it into millilitres.

| |
|---|
| 1.2ℓ |
| + 7.6ℓ |
| 8.8ℓ |

**Key Fact**

To add the units of capacity, always add the same units, litres in litres and millilitres in millilitres.

...e convert it into millilitres.

...000mℓ = 8800mℓ

A fish jar has 20ℓ water and other jar has 18ℓ water. How much more water is in one jar than the other? Give your answer in millilitres.

To find the difference between the capacity of both jars, we will subtract the quantities.

Make two groups of students. Put some flash cards of litre and millilitres in the basket. Ask them to pick some cards and add them.

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Lets' subtract 18ℓ from 20ℓ.

The capacity of water in a jar = 20ℓ
The capacity of water in another jar = −18ℓ
Difference between the capacity of jar = 2ℓ

The difference between the capacity of both jars is 2ℓ.

To find the capacity of water in mℓ we multiply 2ℓ by 1000.

$2ℓ = 2 \times 1000mℓ = 2000mℓ$

One jar has 2000mℓ more water.

**Key Fact**

To subtract the units of capacity always subtract the same quantities, litres from litres, millilitres from millilitres.

**Try Yourself**

A juice pack has 250 mℓ juice and another juice pack has 400 mℓ. What is the difference between the capacity of both juice packs?

## Exercise 5

1. Solve the following:
   (a) 3ℓ 109mℓ + 5ℓ 304mℓ (b) 6.5ℓ + 4.2ℓ (c) 122ℓ + 76
   (d) 34ℓ 200mℓ + 92ℓ (e) 41ℓ 200mℓ + 404ℓ 478mℓ

2. Solve the following:
   (a) 22ℓ 500mℓ − 10ℓ 109mℓ (b) 55ℓ − 32ℓ (c) 2.2mℓ - 1
   (d) 4ℓ 878mℓ − 3ℓ 760mℓ (e) 78ℓ 209mℓ − 16ℓ 142mℓ

3. Zara has two containers. The capacity of one container is 67ℓ 19 and the other is 84ℓ 300mℓ.
   (a) What is the total capacity of the containers?
   (b) What is the difference between the capacity of both containers?

4. A shopkeeper sells 72.8ℓ milk on Saturday and 92.6ℓ milk on Sunday. On which day does he sell less milk and how much? Give your answer in millilitres.

Make two groups of students. Put some flash cards of litre and millilitres in the basket. Ask them to pick some cards and subtract.



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## I have learnt to:

- Use standard metric units to measure the length of different objects.
- Convert larger into smaller metric units (2-digit numbers with one decimal place)
  - kilometres into metres
  - metres into centimetres
  - centimetres into millimetres
- Add and subtract measures of length in same units.
- Use standard metric units to measure the mass of different objects.
- Convert larger into smaller metric units (2-digit numbers with one decimal place)
  - kilograms into grams
  - grams into milligrams
- Add and subtract measures of mass in same units.
- Use standard metric units to measure the capacity of different containers.
- Convert larger into smaller metric units (2-digit numbers with one decimal place) litres into millilitres.
- Add and subtract measure of capacity in same units.
- Solve real life situations involving conversion, addition and subtraction of measures of length, mass and capacity.

### Vocabulary

- Length
- Kilometre
- Metre
- Centimetre
- Millimetre
- Mass
- Kilogram
- Gram
- Capacity
- Litre
- Millilitre

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## Review Exercise

Tick (✓) the correct option.

a) There are _____ metre in one kilometre.
(i) 1 (ii) 10 (iii) 100 (iv) 1000

b) There are _____ grams in one kilogram.
(i) 1 (ii) 10 (iii) 100 (iv) 1000

c) To convert cm into mm, multiply it by _____.
(i) 10000 (ii) 100 (iii) 10 (iv) 1000



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(d) One metre is equal to _____ centimetres.
(i) 1000 (ii) 10 (iii) 1 (iv) 100

(e) One litre is equal to 1000 _____.
(i) grams (ii) metres (iii) millilitres (iv) litres

2. Convert the given units.
(a) 105 km into m (b) 3.4 m into cm (c) 66 kg into
(d) 60 g 498 mg into mg (e) 0.5 g into mg (f) 76ℓ 2 mℓ in
(g) 9.8ℓ into mℓ (h) 90 cm into mm

3. Solve the given units.
(a) 5kg 299g + 9kg (b) 4.5m + 2.8m (c) 78kg 700g + 81kg
(d) 212ℓ 200mℓ + 92ℓ 500mℓ (e) 119ℓ 329mℓ + 365
(f) 65g 313mg + 98g 198mg

4. Solve the given units.
(a) 506kg – 417kg (b) 85m 405cm – 13m
(c) 84kg 711g – 75kg 680g (d) 78ℓ 805mℓ – 63ℓ
(e) 98ℓ 788mℓ – 45ℓ 659mℓ

5. The height of K-2 is 8 km 611m and Mount Everest is 8km 84
(a) What is the difference between their heights? Give your ans in metres.
(b) Find the total height of the mountains?

6. On Eid, Asim buys a goat and a camel to sacrifice. The goat we 55kg and the camel weighs 200kg.
(a) Find the total mass of both animals.
(b) Convert the total mass into grams.

7. The capacity of a bucket is 87ℓ and a tub is 112ℓ 456mℓ. What is the total capacity in millilitres?

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# Time

## Learning Outcomes

**After completing this section, you will be able to:**

- Read and write the time using digital and analog clocks on 12-hour and 24- hour format.
- Convert hours into minutes and minutes into seconds.
- Convert years into months, months into days, and weeks into days.
- Add and subtract measures of time without carrying and borrowing.
- Solve simple real-life situations involving conversion, addition and subtraction of measures of time.

Koala likes to sleep. It can sleep 20 hours in a day. How many seconds does it sleep in a day?



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# Time

It's time for the science experiment. Hours hand is on 10 and minutes hand is on 2. It means that the time is 10 past 10. What is this third hand used for?

The third hand of the clock is seconds hand. When the seconds hand moves from one small mark to another small mark, then 1 second passes. Now, the time is 10 past 10 and 30 sec. This time can be written as 10:10:30.

After 5 seconds

**Key Fact**

When minutes hand completes one rotation, one hour passes.
When seconds hand completes one rotation, one minute passes.

20 past 1 and 30 seconds.

1:20:30

45 past 3 and [illegible] seconds.

3:45:15

Show a real clock to the students and explain what is meant by 1 second.

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To see the time we also use another clock except an analog clock. Can you tell the name of this?

Yes! it is known as digital clock. Digital clock is also used to read the time. It shows time in the digits form.

past 11 and 45 sec.

are 24 hours in a day, To show the time on the clocks. There are ethods.

od I: 12 hours clock:

use a.m. to read the time after 12 midnight to before 12 noon.

use p.m. to read the time after 12 noon to before 12 midnight.

od II: 24 hours clock:

ay runs from midnight to midnight and is divided into 24 hours.

e is shown in 4 or 6 digits.

O'clock midnight is expressed as 00:00 hours and 12 O'clock on is expressed as 12:00 hours.

ead the time given on this clock.

p.m. means, the time is between on and 12 midnight.

## Try Yourself

Can you tell what time is it?

Ask the students to write about their daily routine by correctly using the 12 hours clock time.



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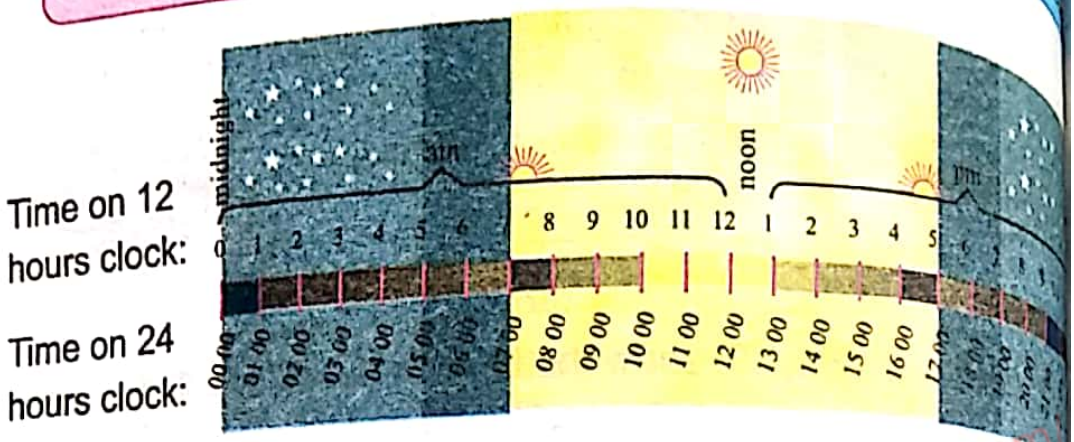
## Try Yourself

Write 5 a.m. and 5 p.m. in 12-hour and 24 hour format.

We did not use the n... 24 in 24 hour format. ... use numbers from 0 to ...




We can see that in 12 hours format, we write 11 p.m. as 11:00 and ... hours format 11 p.m. is written as 23:00.

Let us observe the time which is given in the following clocks. All th... three clocks are showing the same time.

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3 minutes past 3 and 42 seconds

Format to write time in 12-hours

Format to write time in 24-ho...

Ask the students to write about their daily routine by using correct 12 hours and 24 hours clock time.



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## Exercise 1

...r the correct time of your daily activities using the 12 hours ...t format.

| Daily activities | Time in 12 hour | |
|---|---|---|
| Getting up for the school | 6:00 a.m. | 6:00 p.m. |
| Going to the school | 7:45 a.m. | 7:45 p.m. |
| Lunch time in the school | 12:30 a.m. | 12:30 p.m. |
| Playing time in the evening | 4:30 a.m. | 4:30 p.m. |
| Isha Salah | 8:00 a.m. | 8:00 p.m. |
| Sleeping time at night | 10:25 a.m. | 10:25 p.m. |

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2. With the help of clocks, write the correct time in 24- hour form

(a) Look at the clock and tell what time Numan has breakfast?

(b) Look at the clock and tell what time Farheen plays with her friends?

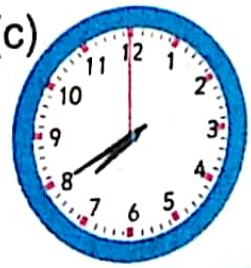
(c) Look at the clock and tell what time Junaid sleeps?

3. Look at the following clocks and tell the time in hours, minutes and seconds:

(a)

(b)

(c)



(d)

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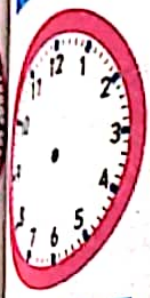
...hands of hours, minutes and seconds according to the given

2:15:30

6:25:03

10:22:55



8:20:01

12:42:16

9:11:31

https://infohubbmssissed.com/

## Conversion of Hours, Minutes and Seconds

### ...ersion of Hours to Minutes

At least 8 hours of sleep a day is essential for good health. How many minutes are there in 8 hours?

...here are 60 minutes in an hour, therefore ...nvert hours into minutes, we will multiply ...s by 60.

$$8\text{ h} = 8 \times 60$$
$$= 480\text{ min}$$

...here are 480 minutes in 8 hours.



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## Convert 3 hours 32 min into minutes.

To convert 3 h 32 min into minutes, first convert 3 hours into minutes then add 32 min in it.

$$3 \text{ h } 32 \text{ min} = 3 \text{ h} + 32 \text{ min}$$
$$= 3 \times 60 \text{ min} + 32 \text{ min}$$
$$= 180 \text{ min} + 32 \text{ min}$$
$$= 212 \text{ min}$$

**Try Yourself**

Convert 5 hours 5 min into minutes.

## Conversion of Minutes to Seconds

Saad solved the division question in 6 min. In how many seconds did he solve the question?

To convert minutes into seconds, we multiply minutes by 60.

$$6\text{min} = 6 \times 60$$
$$= 360 \text{ sec}$$

So, Saad solved the questions in 360 sec.

**Key Fact**

1 min = 60 sec

1 hour = 60 min

## Convert 12 min 12 sec into seconds

To convert 12 min 12 sec into seconds first we convert 12 minutes into seconds and then we will add 12 sec in it.

$$12 \text{ min } 12 \text{ sec} = 12 \text{ min} + 12 \text{ sec}$$
$$= 12 \times 60 \text{ sec} + 12 \text{ sec}$$
$$= 720 \text{ sec} + 12 \text{ sec}$$
$$= 732 \text{ sec}$$

**Try It!**

How many seconds are there in one day?

Write the time in hours on the writing board and ask the students to convert these hours into minutes. Give some flash cards of minutes and ask them to convert them into seconds.



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## Exercise 2

...ert the following time into minutes:

(b) 201h (c) 14 h 12min (d) 5h 55min

...7h 28min (f) 22h 26min (g) 11h 48min (h) 22h 15min

...3h 43min (j) 18h 6min (k) 27h 38min (l) 42h 26min

...vert the following time into seconds:

(b) 43min (c) 1min 13sec (d) 8min 32sec

...17min (f) 63min 58sec (g) 88min 59sec (h) 65min 37sec

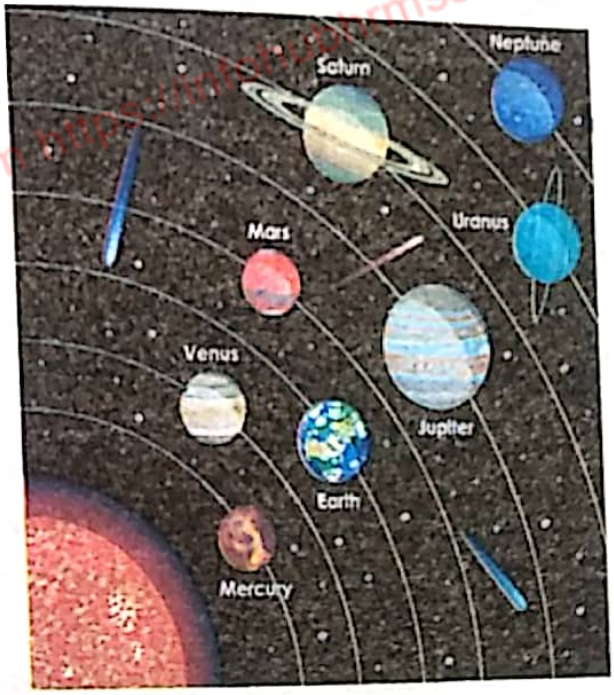
...5min 53sec (j) 100min 11sec (k) 176min 18sec (l) 432min 03sec

...14min 24sec

## Conversion of Years, Months and Days

### ...nversion of Years to Months

The planet Jupiter completes one rotation around the Sun in about 12 years. In how many months does it complete a rotation?




...re are 12 months in a year, therefore, to convert 12 years into ...ths, we will multiply number of years by 12.

12 years = 12 × 12

= 144 months

...et Jupiter completes one rotation around the sun in 144 months.



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**Convert 4 years 11 months into months.**

To convert 4 years 11 months into months, first we convert 4 years into months and then add 11 months in it.

4 years 11 months = 4 years + 11 months
= 4 × 12 months + 11 months
= 48 months + 11 months
= 59 months

## Conversion of Months to Days

It takes about 2 months to climb Mount Everest during the favourable weather. How many days are there in 2 months?

To convert months into days, we multiply the number of months by 30.

2 months = 2 × 30 days
= 60 days

There are 60 days in 2 months.

**Convert 5 months 44 days into days.**

To convert 5 months 44 days into days, first we convert 5 months into days and then add 44 days in it.

5 months 44 days = 5 months + 44 days
= 5 × 30 days + 44 days
= 150 days + 44 days
= 194 days

**Try Yourself**

Convert 10 months 22 days into days.

TEACHING POINT

Give some flash cards to the students in which years are written and ask them to convert these into months.



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## ...versions of Weeks to Days

A shark can live about 10 weeks without food. How many days are there in 10 weeks?

...re are 7 days in a week. Therefore, to ...ert weeks into days, we multiply ...ber of weeks by 7.

10 weeks = 10 × 7 days
= 70 days

There are 70 days in 10 weeks.

**Key Fact**

- 1 day = 24 hours
- 1 week = 7 days
- 1 month = 30 days
- 1 year = 12 months

...vert 8 weeks 20 days into days.

To convert 8 weeks 20 days into days, first we convert 8 weeks into days and then add 20 days in it.

8 weeks 20 days = 8 weeks + 20 days
= 8 × 7 days + 20 days
= 56 days + 20 days
= 76 days

**Try It!**

How many weeks are there in 4 years? How many days are there in 12 years?

## Exercise 3

...vert the following into months:

(a) 9 years (b) 4 years (c) 12 years

(d) 21 years (e) 8 years 3 months (f) 5 years 4 months

(g) 20 years 6 months (h) 17 years 10 months (i) 30 years 11 months

(j) 24 years 7 months (k) 15 years 11 months (l) 43 years 7 months



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2. Convert the following into days:

(a) 11 weeks (b) 8 weeks (c) 5 weeks

(d) 25 weeks (e) 9 weeks 6 days (f) 7 weeks 1 day

(g) 2 weeks 5 days (h) 4 weeks 3 days (i) 32 weeks 4 days

(j) 27 months 3 days (k) 41 months 12 days (l) 54 months 13

## Addition and Subtraction of Measures of Time

During an information tour, the students spent 3 hours 15 minutes in Army museum and 2 hours 22 minutes in Science museum. How much time did they spend at both places?

To find the total time, they spend at both places, we add the time and convert into minutes.

| | | | |
|---|---|---|---|
| Time spent in Army museum | = | 3h | 15min |
| Time spent in Science museum | = | + 2h | 22min |
| Total time | = | 5h | 37min |

They spent 5 hours 37 minutes. Now, we will convert this time into minutes.

$$5 \text{ h } 37 \text{ min} = 5 \text{ h} + 37\text{min}$$
$$= 5 \times 60 \text{ min} + 37\text{min}$$
$$= 300 \text{ min} + 37\text{min}$$
$$= 337 \text{ min}$$

So, the students spent 337 minutes at both places.

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...vernment launched two projects simultaneously. First project ...3 years, 7 months and second project 1 year, 2 months to ...plete. Find how much less time does second project take to ...plete? Write your answer in months.

To find out how less time the second project is completed in? We subtract the time duration and convert it into months.

**Key Fact**

To add/subtract the units of time always start from ones.

| | | Years | Months |
|---|---|---|---|
| Duration of first project | = | 3 | 7 |
| Duration of second project | = | −1 | 2 |
| Difference of time between two projects | = | 2 | 5 |

...e second project takes 2 years 5 months less time than the first ...ject.

...vert this duration into months.

2 years 5 months = 2 years + 5 months

= 2 × 12 months + 5 months

= 24 months + 5 months

= 29 months

...e second project takes 29 months less than the first project.

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## Exercise 4

1. Solve the following:
   (a) 34 h 11 min 13 sec + 11 h 18 min 32 sec
   (b) 24 h 34 min 37 sec + 2 h 21 min 11 sec
   (c) 54 h 19 min 45 sec + 43 h 20 min 10 sec
   (d) 5 h 15 min 31 sec + 4 h 4 min 25 sec
   (e) 14 years 7 months 2 days and 7 years 4 months 2 days
   (f) 51 h 02 min 8 sec + 37 h 11 min 09 sec
   (g) 49 years 2 months 5 days + 40 years 5 months 11 days
   (h) 27 years 3 months 5 days + 32 years 6 months 4 days

2. Solve the following:
   (a) 45 h 45 min 49 sec – 10 h 23 min 38 sec
   (b) 57 h 22 min 27 sec – 33 h 11 min 12 sec
   (c) 65 h 28 min 56 sec – 54 h 20 min 45 sec
   (d) 6 h 26 min 42 sec – 5 h 15 min 31 sec
   (e) 25 years 8 months 3 days – 23 years 6 months 1 day
   (f) 62 h 53 min 29 sec – 51 h 42 min 08 sec
   (g) 88 years 11 months 29 days – 46 years 10 months 15 days
   (h) 37 years 6 months 29 days – 17 years 6 months 18 days

3. Ahmad went to his grand mother's home on Sunday and he stays there for 2 hours and 20 minutes. On Monday, he went to his aunt's home and he spent 4 hours and 23 minutes. Find:
   (a) How much time did he spend at his relative's home?
   (b) Write the time in minutes.

4. Ejaz travelled 6 hours 34 minutes 45 seconds in a bus and 4 hours 20 minutes 12 seconds in a train. Find:
   (a) How much more time did he travel in the bus than the train?
   (b) How much did he travel altogether?

5. Maha takes 9 hours 23 minutes to complete a picture while Rohan takes 7hours 10 minutes to complete the same picture. Find:
   (a) How much more time does Maha take?
   (b) The total time they take altogether.



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## I have learnt to:

- ad and write the time using digital
- d analog clocks on 12-hour and
- 4-hour format.
- nvert hours into minutes and
- nutes into seconds.
- nvert years into months, months
- o days and weeks into days.
- d and subtract measures of time
- hout carrying and borrowing.
- lve simple real life situations
- olving conversion, addition and
- btraction of measures of time.

**Vocabulary**

- Months
- Weeks
- Conversions
- Addition
- Subtraction
- Time
- Hours
- Minutes
- Seconds
- Days
- Years

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## Review Exercise

k (✓) the correct option.

There is 13: 50 in 24 hour clock, what time will be in 12-hour clock?

i) 1:50 a.m. (ii) 3:50 p.m. (iii) 1:50 p.m. (iv) 12:50 p.m.

There is 3: 55 in 12 hour clock, what time will be in 24-hour clock?

i) 13:55 (ii) 14:55 (iii) 15:55 (iv) 16:55

Which time is the longest from the following?

i) 2 years (ii) 12 months (iii) 1 year 3 months (iv) 350 days

There are _____ months in 2 years 6 months.

i) 21 (ii) 28 (iii) 26 (iv) 30

To convert years into months, we multiply the given years by ___.

i) 24 (ii) 10 (iii) 11 (iv) 12



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2. Colour the correct time boxes by using the 12-hour format.

| | Daily activities | Time in 12 hour | |
|---|---|---|---|
| a | Time of Fajar Salah | 5:00 a.m. | 5:00 p.m. |
| b | Breakfast time | 7:30 a.m. | 7:30 p.m. |
| c | School's assembly time | 8:00 a.m. | 8:00 p.m. |
| d | Break time in school | 12:20 a.m. | 12:20 p.m. |
| e | Time to watch TV in the evening | 6:00 a.m. | 6:00 p.m. |
| f | Dinner time | 9:25 a.m. | 9:25 p.m. |

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3. Convert the following into minutes:

(a) 8h (b) 112h (c) 15h 13min (d) 7h 15min

(e) 28h 39min (f) 33h 25min (g) 11h 13min (h) 23h 16min

(i) 6h 54min

4. Convert the following into seconds:

(a) 78min (b) 33min (c) 4min 17sec (d) 9min 42sec

(e) 2min 53sec (f) 21min 11sec (g) 97min 47sec (h) 48min 47sec

(i) 433min 44sec

5. Convert the following into months:

(a) 5 years (b) 3 years (c) 22 years

(d) 32 years (e) 9 years 4 months (f) 15 years 10 months

(g) 29 years 8 months (h) 19 years 11 months (i) 54 years 9 months



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vert the following into days:

5 weeks (b) 9 weeks (c) 6 weeks

7 weeks (e) 11 weeks 2 days (f) 9 weeks 5 days

4 weeks 6 days (h) 56 weeks 4 days (i) 43 weeks 3 days

e the following:

37h 11min 38sec + 32h 34min 16sec

24h 25min 38sec + 32h 34min 06sec

57h 25min 35sec + 3h 13min 14sec

e the following:

33h 33min 38sec – 00h 22min 26sec

55h 56min 58sec – 44h 43min 37sec

17h 54min 49sec – 21h 32min 00sec

an spends 5 hours 23 minutes studying and 1 hour 20 minutes ing.

How much time does he spend in both activities?

Write the total time in minutes.

ook takes 2 hours 43 minutes 54 second to make a savoury dish 1 hour 12 minutes 24 seconds to make a dessert. Find how ch more time does he take to make the savoury dish.

end Yar spends 7 years 4 months 2 days in Suadi Arabia and ears 7 months 7 days in UAE.

How much time does he spend out of the country?

Write the total time in days.

hreen completes her medical education in 4 years 10 months days and her house job in 2 years 2 days. How much time did she end in medical education and house job?

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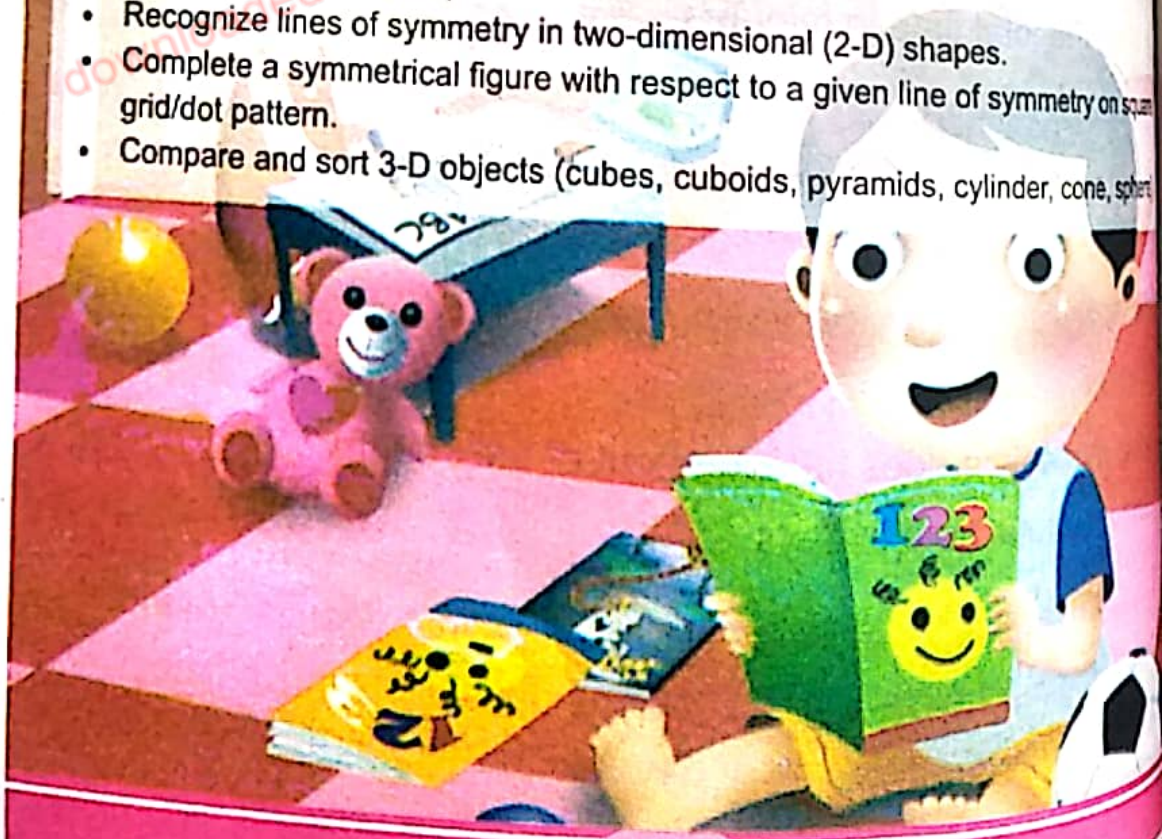
# Unit 6

# Geometry

## Learning Outcomes

**After completing this unit, you will be able to:**

- Recognize and identify parallel and non-parallel lines.
- Recognize an angle formed by intersection of two rays.
- Measure angles in degree (°) by using protractor.
- Draw an angle of given measurement and use the symbol (∠) to represent it.
- Differentiate acute, obtuse and right angles.
- Measure angles using protractor where
  - Upper scale of protractor reads the measure of angle from left to right.
  - Lower scale of protractor reads the measure of angle from right to left.
- Identify right angles in 2-D shapes
- Describe radius, diameter and circumference of a circle.
- Find perimeter of a 2-D figures on a square grid.
- Recognize that perimeter is measured in units of length.
- Find area of 2-D figures on a square grid.
- Recognize that area of a square is measured in metre square ($m^2$) and centimetre square ($cm^2$)
- Recognize lines of symmetry in two-dimensional (2-D) shapes.
- Complete a symmetrical figure with respect to a given line of symmetry on square grid/dot pattern.
- Compare and sort 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere



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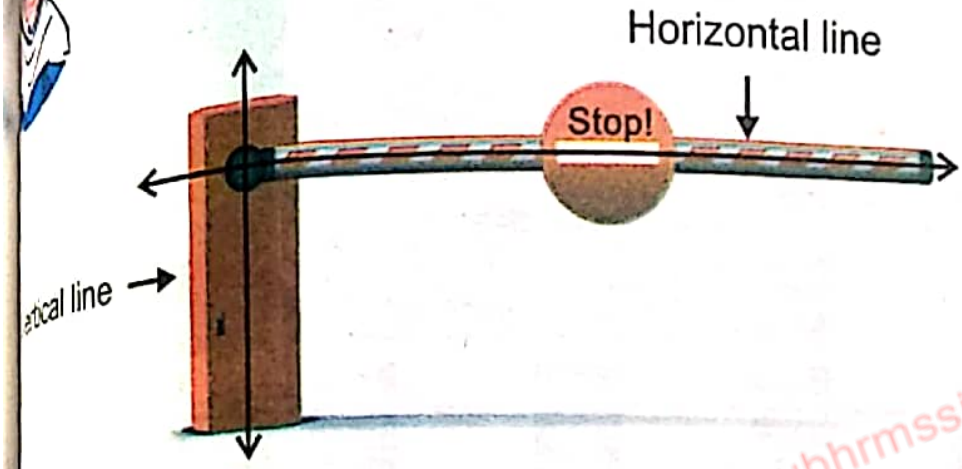
# Horizontal and vertical lines

Look at the figure given below.

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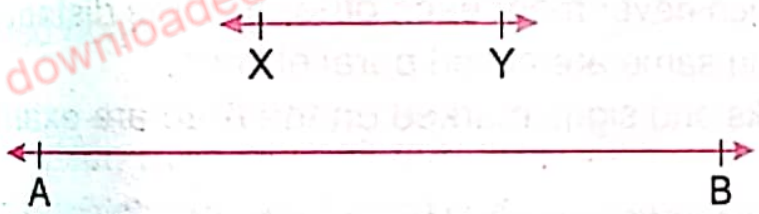
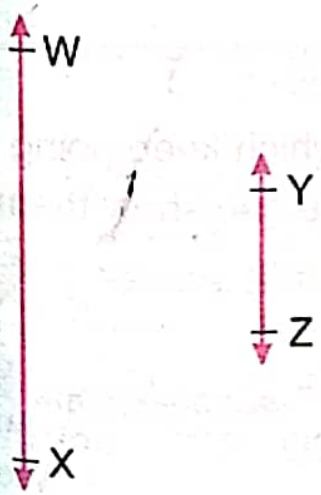
at these lines. Line XY and line AB are horizontal lines.




at these lines. Line YZ and line WX are vertical lines.



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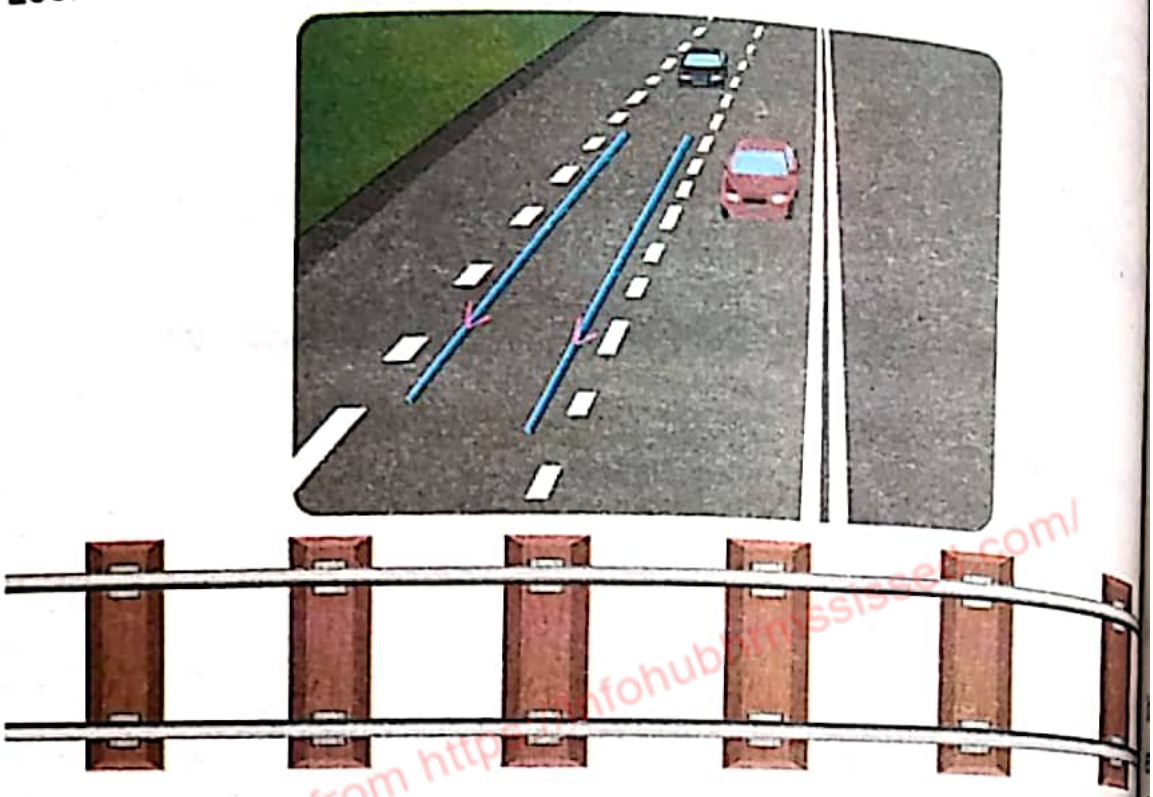
# Parallel and Non-parallel lines



## Parallel Lines:

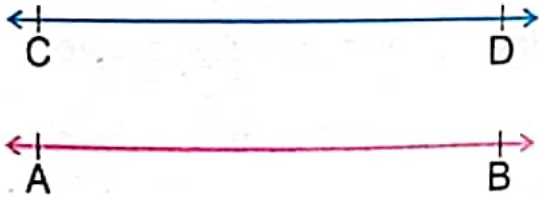
Look at the following figures.



The lines which never meet each other and the distance between the always remain same are called parallel lines.

Railway tracks and signs marked on the road are examples of parallel lines.

Look at the two lines given below:




AB and CD are parallel lines which keep going straight on both ends and never meet each other. We can show them by using a symbol as:

AB || CD

It is read as: AB is parallel to CD.

**Try Yourself**

Look at the things in your surroundings, Can you see parallel lines?



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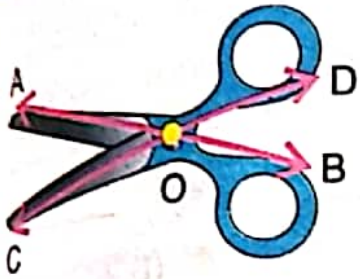
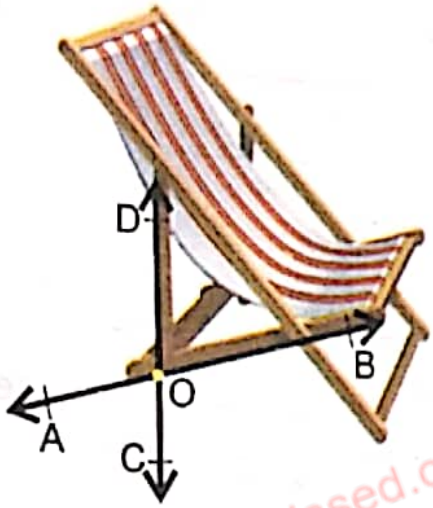
## Parallel lines:

Let's take a look on these figures:

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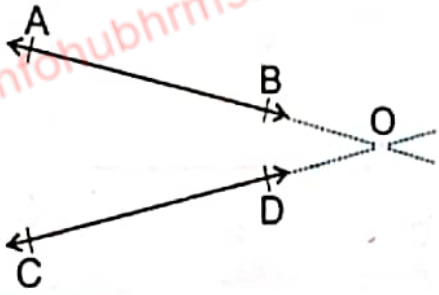
e given figures, AB and CD intersect
ther at point O.
ch lines which intersect each other at
oint are called non-parallel lines.



Non-parallel lines are those lines which intersect each other at any point if they are extended.

**Try It!**

Look at the things around us. Can you distinguish between parallel and non-parallel lines?

Draw some parallel and non-parallel lines on the board and explain the difference between them.



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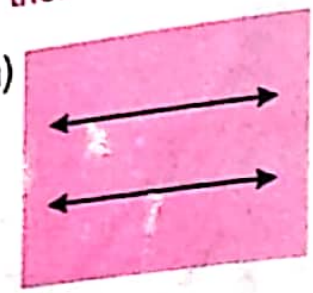
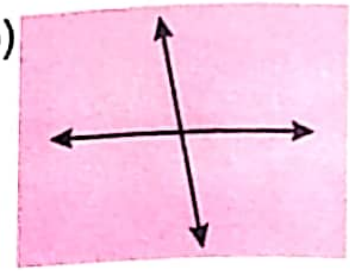
## Exercise 1

1. Identify parallel and non-parallel lines from the given lines and write their names as well.

(a)

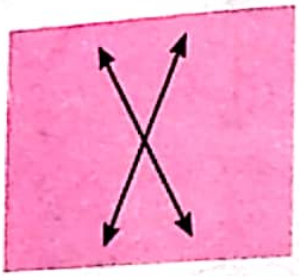


(b)

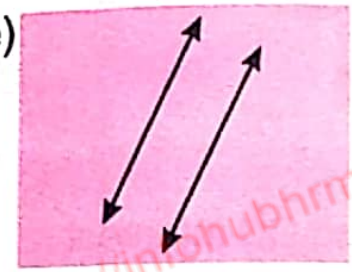


(c)

(d)



(e)



(f)

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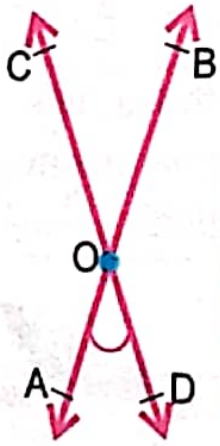


## Angle

Let's look at the figures on the left. Here line AB and CD intersect each other at point O.

When two non-parallel lines intersect each other at a point, different angles are formed at the common point.

Draw some non-parallel lines on the board and explain about angles.



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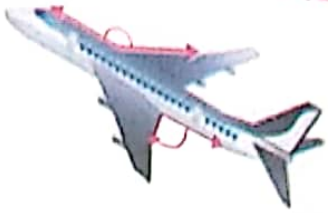
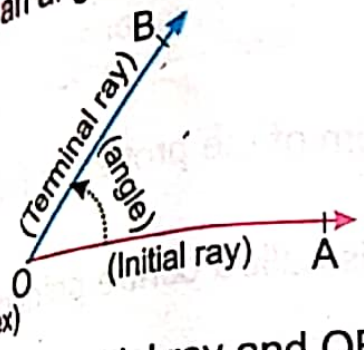
these figures:



shown in the pictures given above are different angles.

showing non-parallel lines OA and OB are intersecting each other at point O, ing an angle ∠AOB.




we call OA initial ray and OB terminal ray. common point O is called vertex of the angle. We can write this as:

∠AOB or ∠BOA

symbol ∠ is used to represent an angle.

**Try Yourself**

Look at the clock and find what angles are its hands making?

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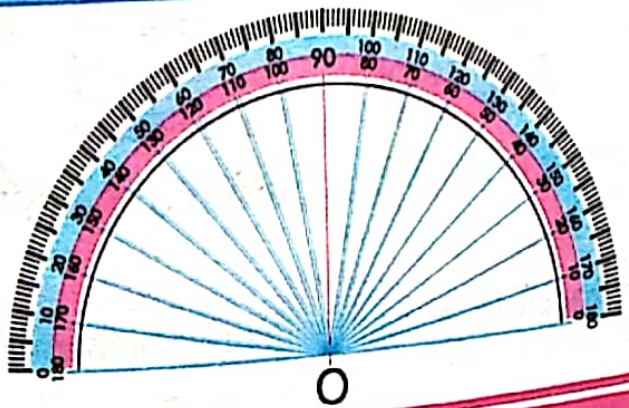
## Measurement and Construction of Angles

Fozia has a geometry box. There is a protractor in it. By using it, we can draw and measure an angle.



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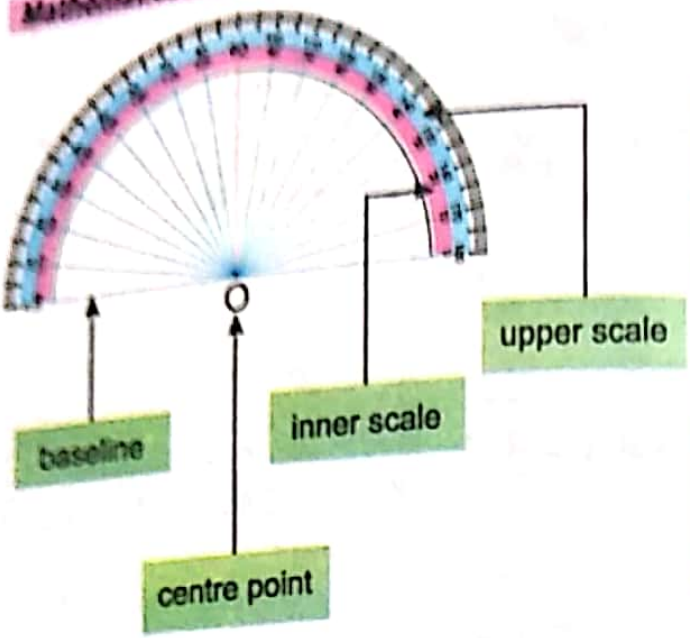

**Key Fact**

- A protractor has 180 small parts and each small part is equal to 1 degree.
- The unit of measurement of an angle is degree. We represent it by the symbol '°'.

**Baseline:** The straight line at the bottom of the protractor is called the baseline.

**Centre point:** The middle of baseline is called centre point of the protractor.

**Scale:** There are two scales in every protractor, an inner scale and an outer scale.

**Inner scale:** It starts from 0° and is up to 180°. The measurement of an angle is taken from right to left on this scale.

**Outer scale:** It also starts from 0° and is up to 180°. The measurement of an angle is taken from left to right on this scale.

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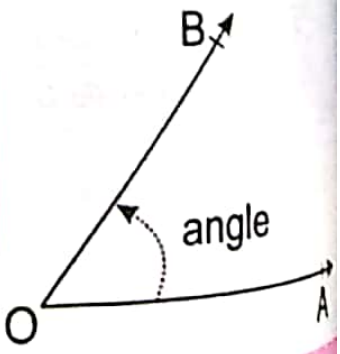
## Measurement of an Angle:

∠AOB is an angle. We measure it by using a protractor.




Show protractor to the students and tell them about its parts.



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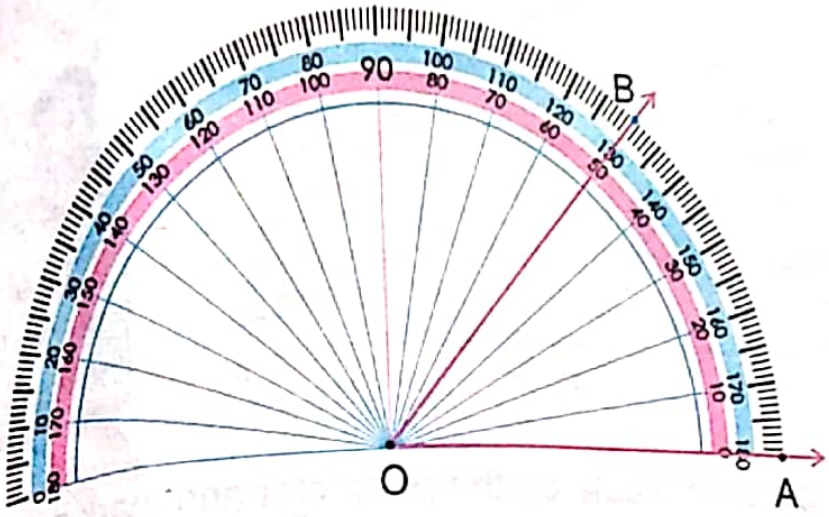
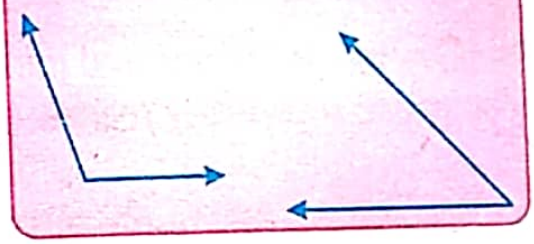
centre point of the protractor on the vertex O of angle ∠AOB.
the base line of protractor exactly on the ray OA.
the value of the angle on the inner side.




the angle measures 50° on the side.
ngle is: ∠AOB = 50°

**Try Yourself**

Measure the angles given below by using a protractor.



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## struction of Angles:

Draw an angle ABC of 180° by using a protractor.

aw an angle by using a protractor, first draw a ray BC with the help der.

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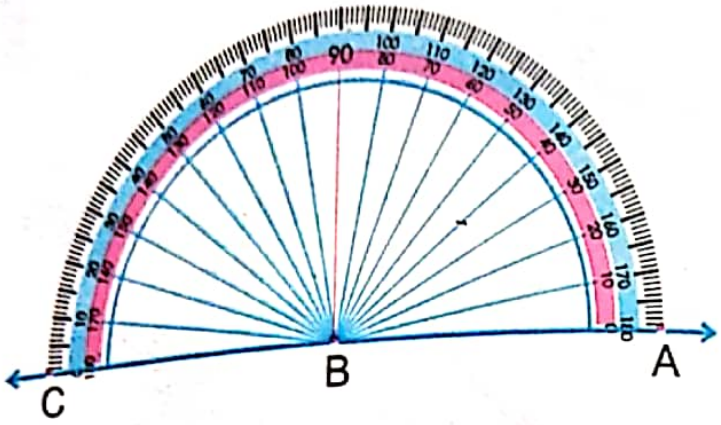
Place centre point of the protractor on point B and place baseline of the protractor exactly on ray BC.



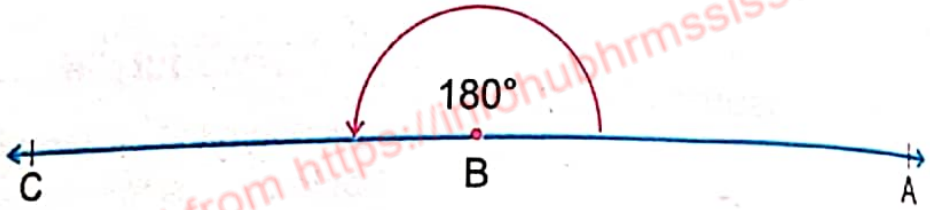

**Try Yourself**

Draw an angle of 140° by using a protractor.

**Key Fact**

This angle can also be drawn by using the inner scale.

Look at the outer scale on the protractor and mark point A on the arm at 180°.

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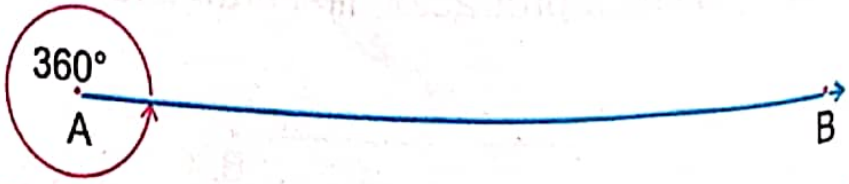
Remove the protractor and join point B to point A.

$\angle ABC = 180°$

## Difference between Acute, Obtuse, and Right Angle

As you know the unit of measurement of an angle is degree. The following ray AB completes 360° in one revolution around its initial point A.



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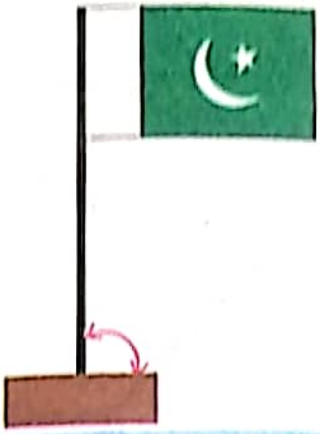
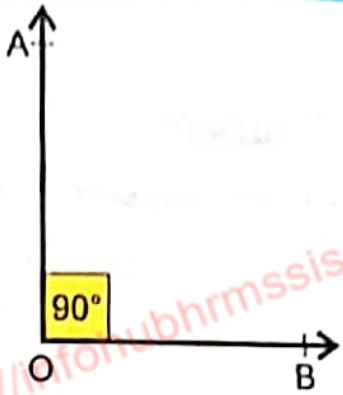
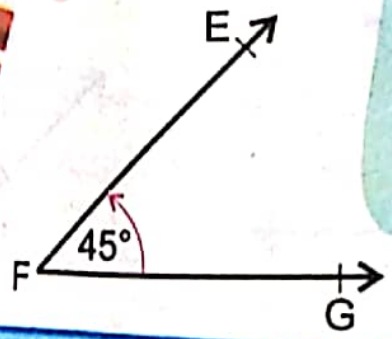
Look at the angles formed in the following figures. They are of different measurements.



An angle of measure 90° is called a right angle. Angle AOB in the figure is a right angle.

$\angle AOB = 90°$






All the angles which measure less than 90° (right angle) are called acute angles. ∠ EFG in the given figure is an acute angle.

$\angle EFG = 45°$

## Try Yourself

Which of the following angles is an acute angle?

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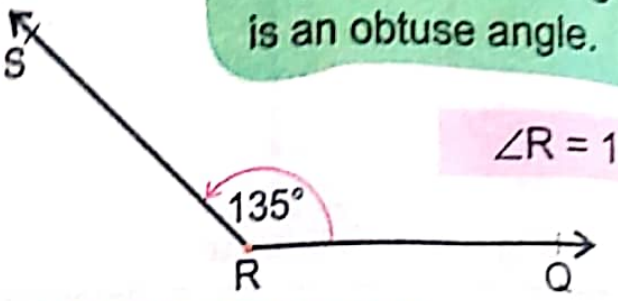
All the angles which measure greater than 90° (but less than 180°) are called obtuse angles. ∠R in the given figure is an obtuse angle.

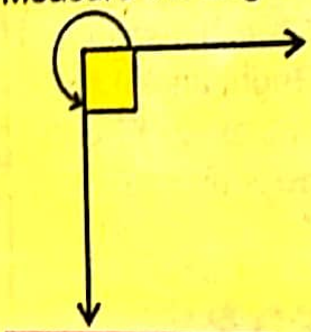


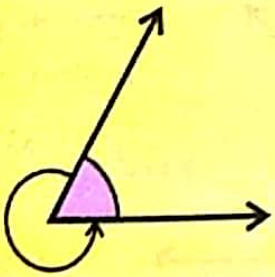

∠R = 135°

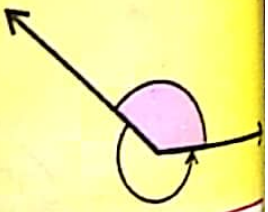
## Try Yourself

Which of the following is an obtuse angle?

Measure the angles and write their types.







Give students flash cards of different angles and ask them to categorize them as right, acute and obtuse angles.



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# Right angle in 2-D shapes

Dania has a square picture frame. Do you know what angles are formed at each corner of the frame?

All sides of a square figure are equal in length and all angles are right angles.

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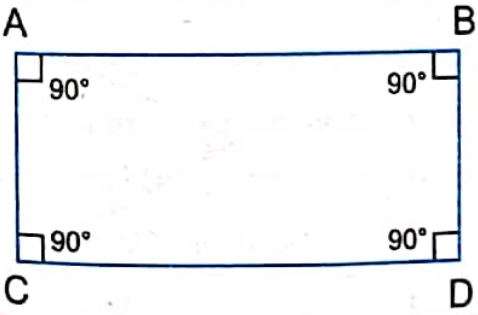
angle:

Hina has a rectangular colour box. What angles are there in a rectangle?

The lengths of opposite sides in a rectangle are equal. Like a square, all the angles of a rectangle are equal.




Ask the students to draw a square and a rectangle, measure all the angles by using a protractor and tell which of them are right angles.



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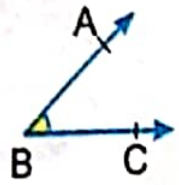
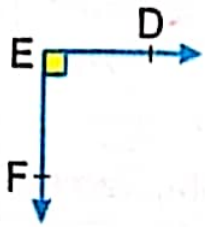
## Exercise 2

1. Write the type of angles in the following:

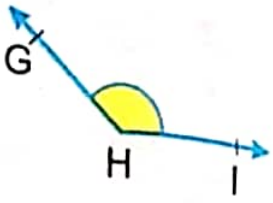
(a)




(b)

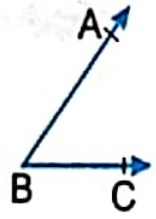


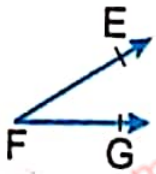

(c)

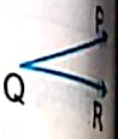



(d)

2. Measure the following angles.



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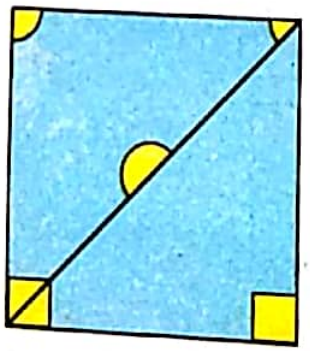
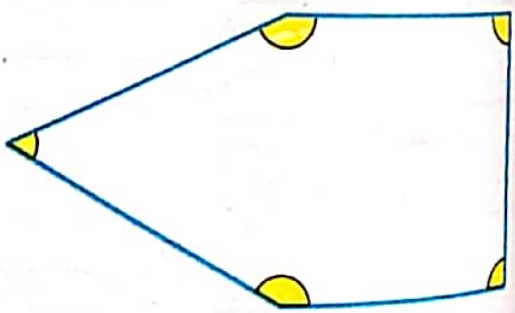
3. Construct the angles of the given measurements.

(a) 60° (b) 30° (c) 115° (d) 90°

4. Measure the angles in the following figures and write their names as well:







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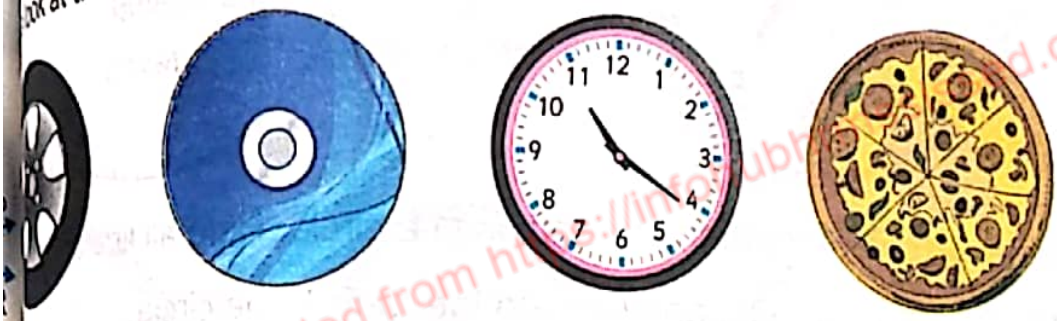
Tahir has a cycle which has two wheels. What is the shape of these wheels?

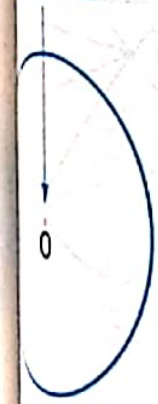
The shape of wheels is like a circle.

Look at the following figures:



These figures are of circular shape. The figures which have no edge like are called circular figures. Each circle has a centre point.

Centre Point




There is a point in the centre of a circle from which the distance of all the points of the circle is same. This point is called the centre point of a circle.

Point "O" is the centre point of the circle given on the left. A circle is identified by the name of its centre. We can call this circle "O".

A circle is a set of points in which all the points are at an equal distance from its centre.

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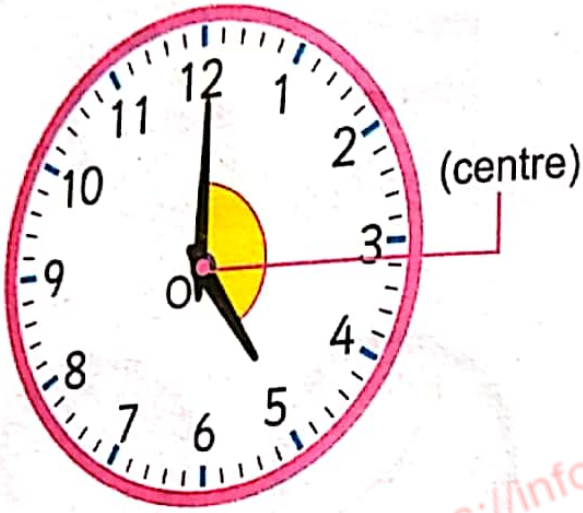
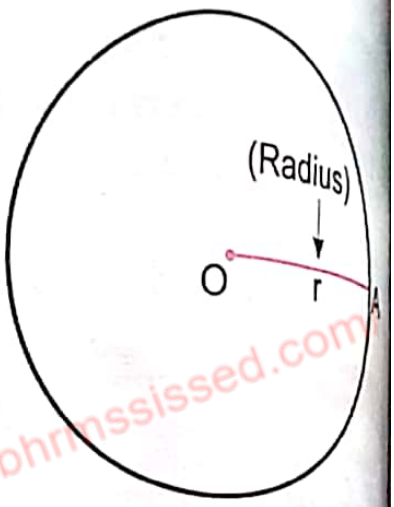
## Radius of a Circle:

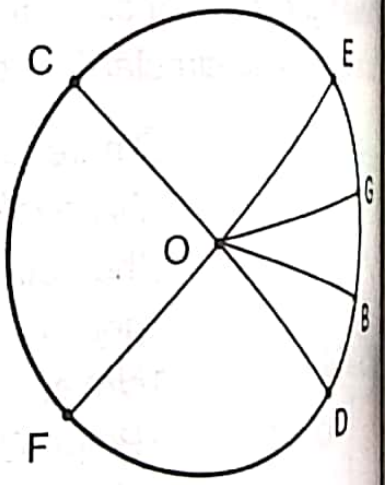
The line segment which joins any point on the circle to its centre is called radius of the circle. Usually, the radius of a circle is represented by "r".

In the figure given below, OA is the radius of the circle. We can write it as r = OA




There can be more than one radius in a circle. Here all line segments OB, OC, OD, OE, OF, and OG are the radii of the circle.



**Key Fact**

The length of all the radii in a circle is same.

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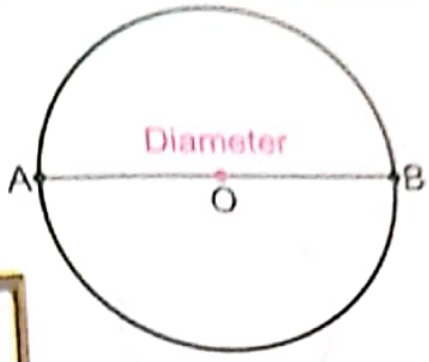
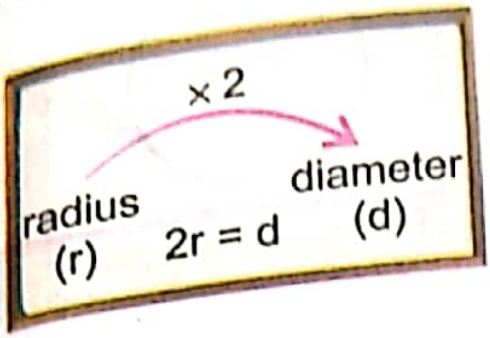
**of a circle:**
segment which joins any two
a circle and passes through its
called a diameter.




**Fact**
of a circle
its radius.




## ference of a circle:

Tahir has a cycle. How much distance does its wheel cover in one complete revolution?

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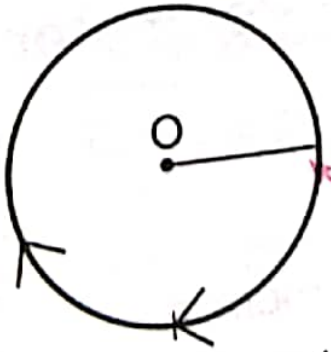
Distance covered in one revolution

Distance covered in one revolution is equal to circumference of a circle.




Circumference of a circle

Let's look at this circle.

Draw some circles on the board and tell students about each part of a circle. Ask them to draw a circle in the notebooks and write the names of its parts.



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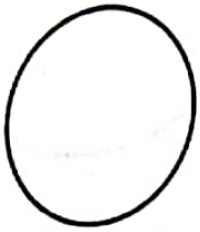
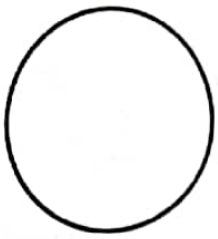
## Exercise 3

1. Draw the parts of the following circles:



Diameter of a circle

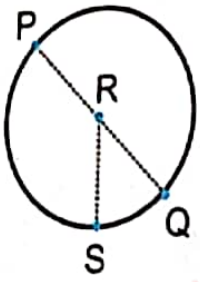


Radius of a circle

Centre of a circle

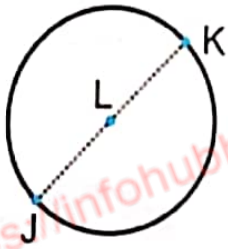
2. Write the name of parts of the circles.

(a)



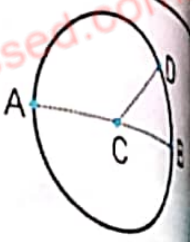

Centre:_____
Diameter:_____
Radius:_____

(b)




Centre:_____
Diameter:_____
Radius:_____

(c)




Centre:_____
Diameter:_____
Radius:_____

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# Perimeter and Area

### Perimeter:

Zahid's room is rectangular. What is meant by its perimeter?

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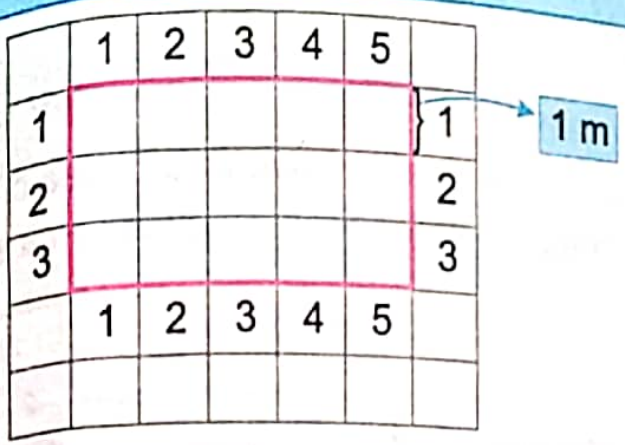
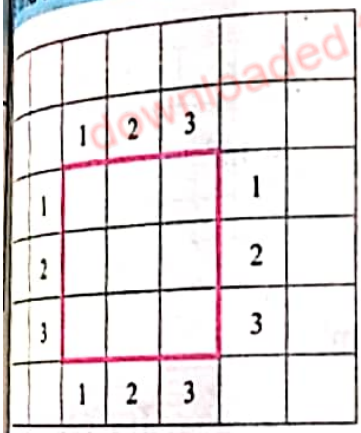
Total length of the boundary of a room is called its perimeter. We can find the perimeter of a room with the help of a square grid.




...the perimeter, we shall add the lengths of all the sides. As the ...ide is 1 metre long, so we add the lengths of all the sides to find ...imeter.

...eter of the rectangular room = 5 m + 3 m + 5 m + 3 m = 16 m

**...find the perimeter of given figure.**

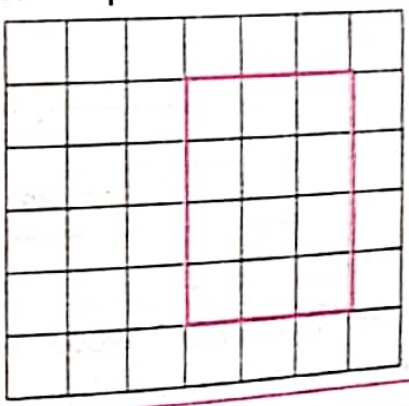


To find the perimeter of a square, we shall add its all sides.

Perimeter of a square = 3 cm + 3 cm + 3 cm + 3 cm = 12 cm

**Try Yourself**

Find the perimeter.



**Key Fact**

...al length of the ...oundings of a closed ...re is called perimeter of ...figure.

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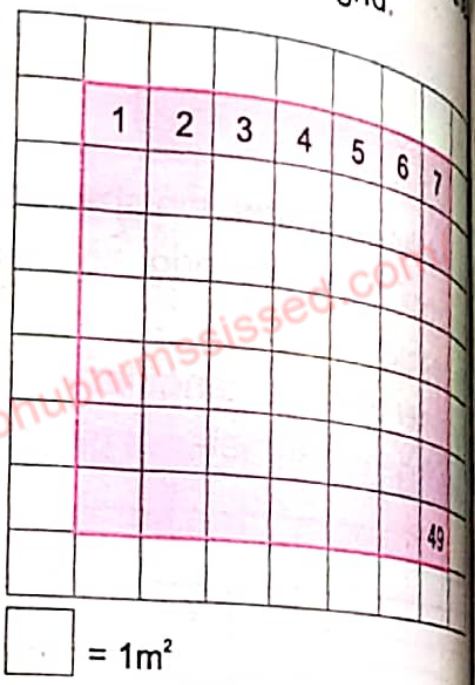
## Area:

Fawaz's room is of square shape. How many tiles of 1 square metre are required for flooring?

To find the number of tiles we have to find area of the room first. In the figure below, the area of the room is shown on a square grid.



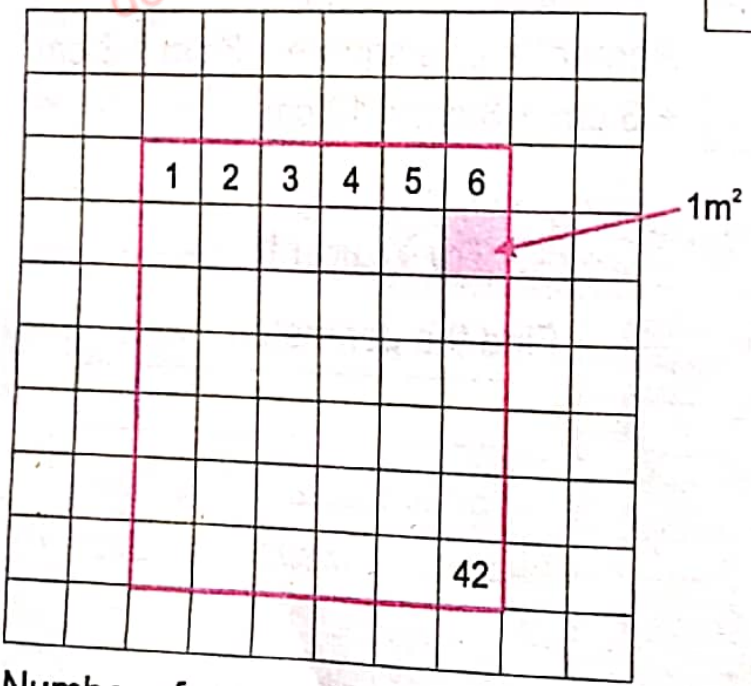

The number of square boxes in this square grid represents the area of the room.

Number of squares = 49

Therefore area of the room = 49m²

So, 49 tiles of 1m² are required.

Find the area of square figure.

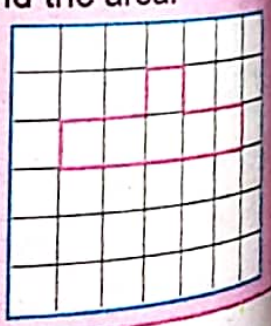



Number of square boxes = 42

Therefore, area of the figure = 42 m²

### Try Yourself

Find the area.





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**Key Fact**

Surface covered by a square is called area. Area of a square figure can be denoted in centimetre square and metre square.

**Try Yourself**

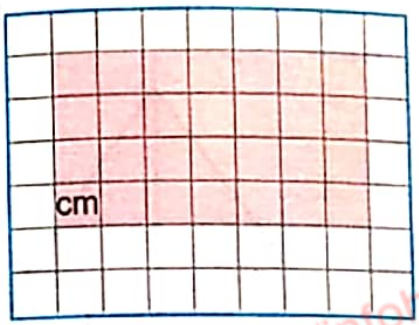
Draw a square and a rectangular figure on the square grid with same perimeter and area.

## Exercise 4

1. Find the perimeter of the given figures.

(a)

(b)

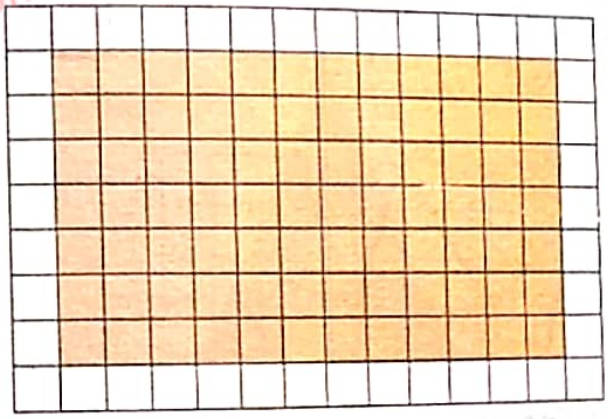



(c)

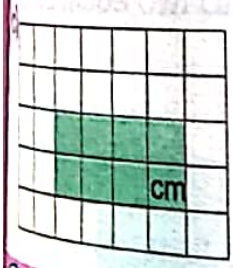
2. Find the area of the given figures.

(a)

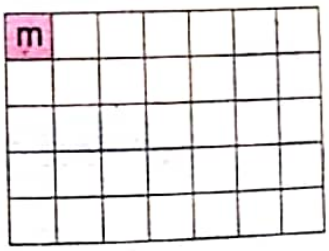
(b)



(c)




(d)




Give a square grid paper to the students and ask them to draw squares and rectangles of different lengths on it and find their perimeter and area.



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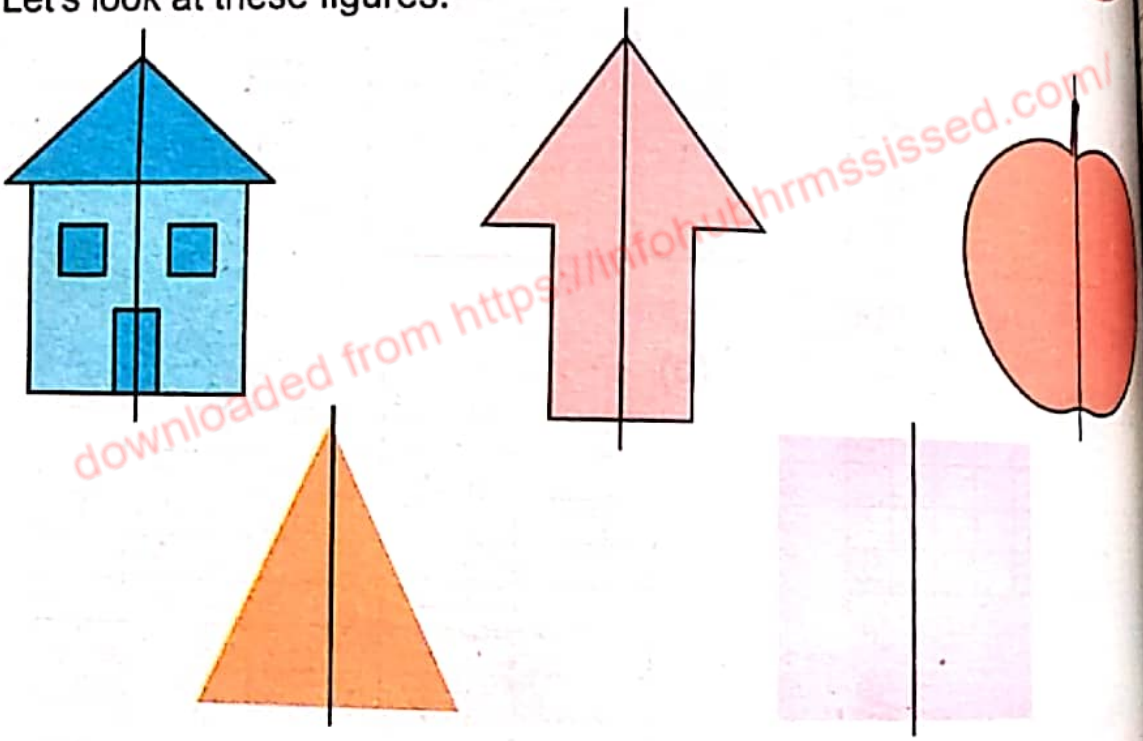
## Symmetry:

Ahmad's teacher drew a star on his notebook for doing good work.

If we draw a line AB as shown in the figure. We see that the star looks the same on both sides. The line AB is called line of symmetry.

Let's look at these figures.



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The line of symmetry divides all these figures into two equal parts.

**Key Fact**

Symmetry means when we turn, flip, or rotate a figure, it takes exactly the same shape as before.



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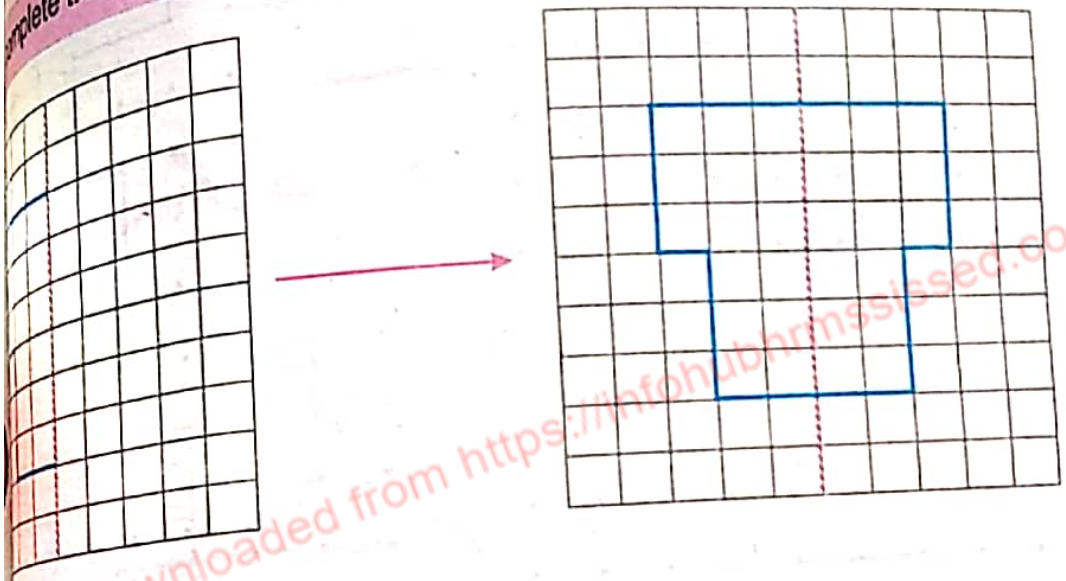
## Symmetrical Figures:

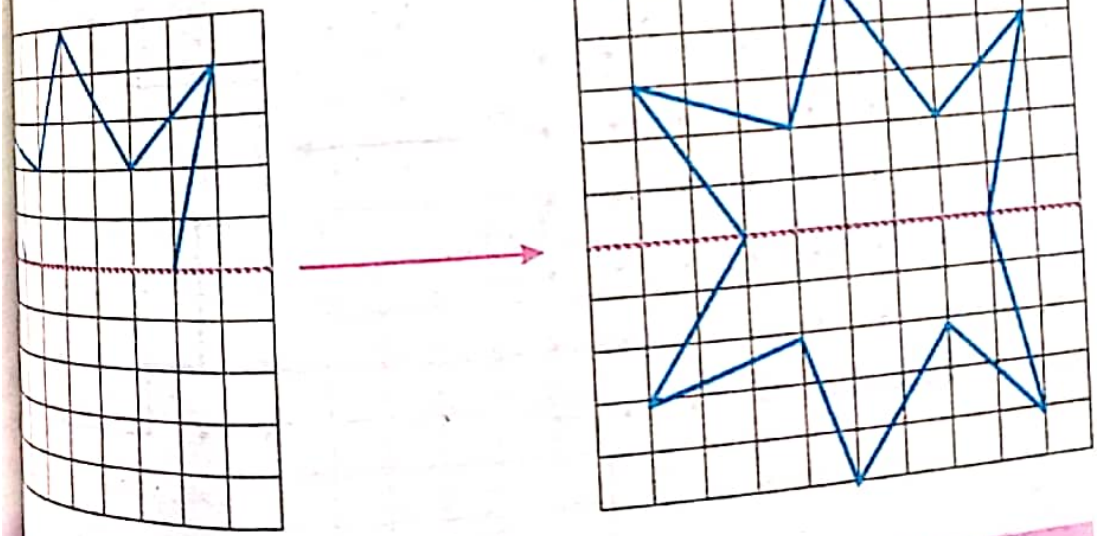
If one half of a symmetrical figure is given, we can complete it by drawing its remaining half.

**Key Fact**

There can be more than one lines of symmetry for difference figures.

Complete the following figures with the help of line of symmetry.





Give cards of different shapes to the students and ask them and identify symmetrical shapes.

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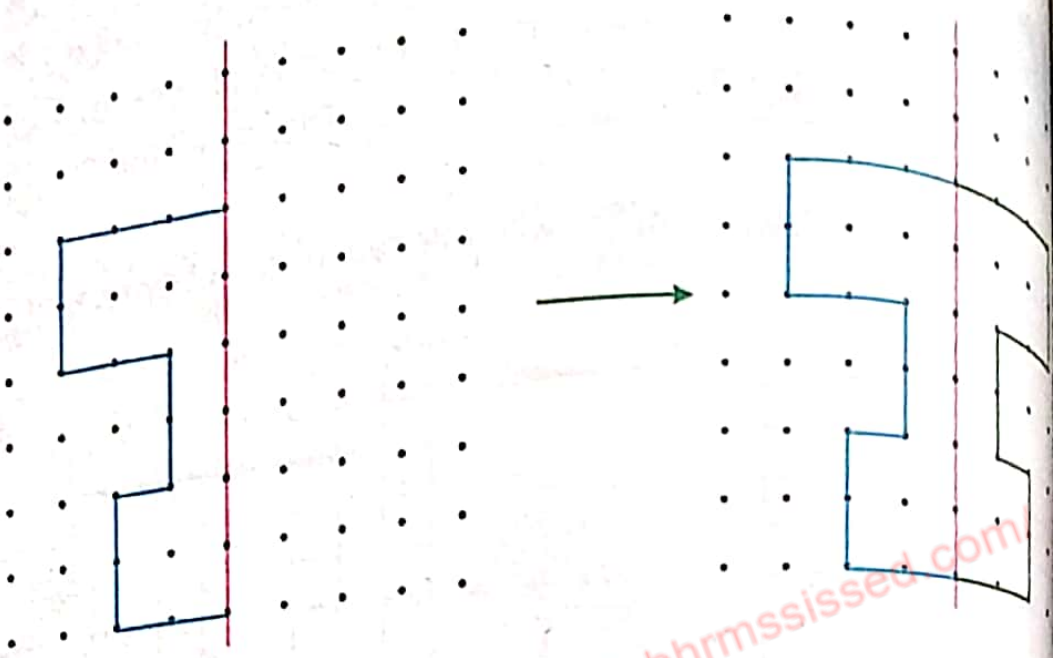
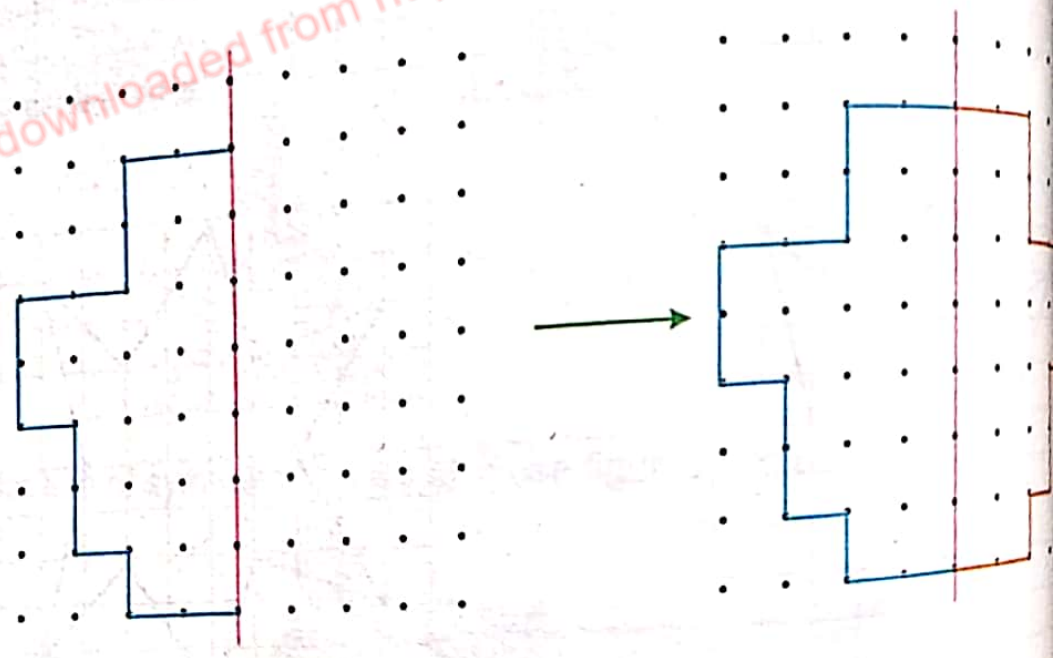
## Let's complete the following symmetrical figures on dot patterns.





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TEACHING POINT

Give different dotted cards of half-figures to the students and ask them to complete the figures.



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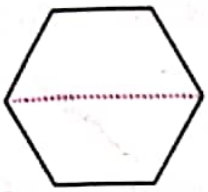
## Exercise 5

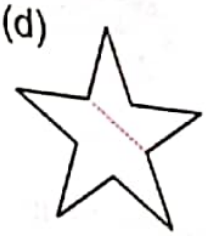
(✓) on the figures where you can see line of symmetry.

(b)

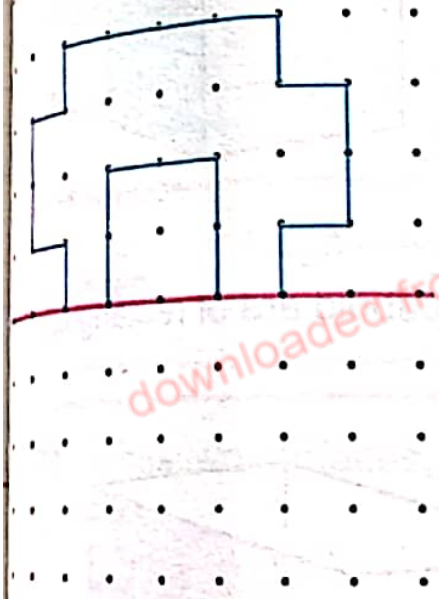


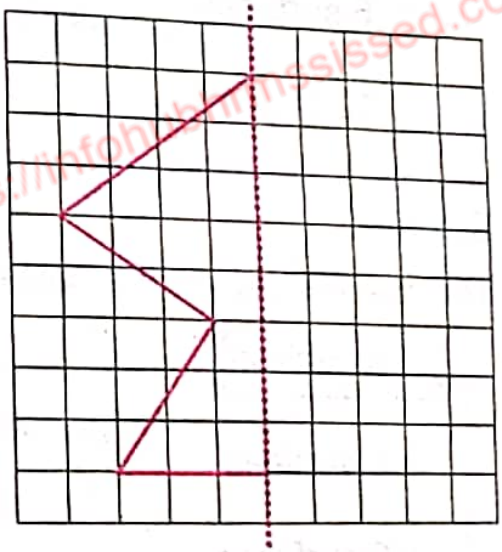
(c)

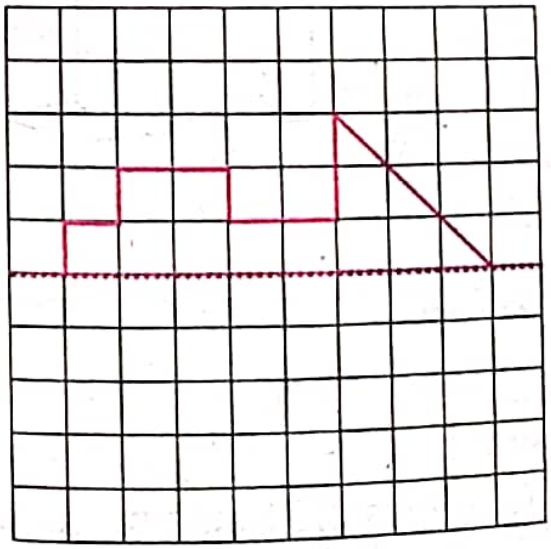
(d)



plete the given figures.







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# Comparison of 3-D shapes:



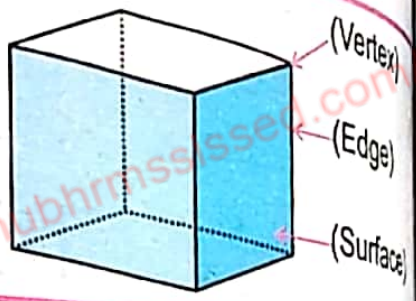
## Cube:

Faraz's father gave a gift on his birthday. Can you tell the shape of the gift box?

This is a cube. All the surfaces of a cube are of squared shape. In a cube, length, width and height are same.

**Properties:**

- 8 vertices
- 6 surfaces
- 12 edges

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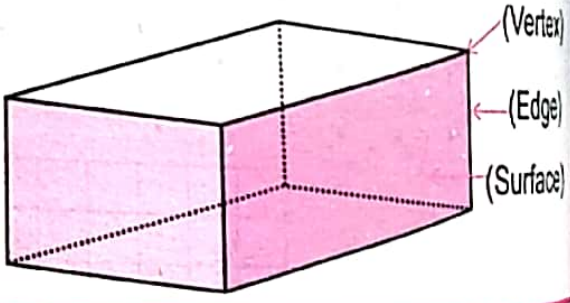
## Cuboid:

This is a cuboid. All the surfaces of a cuboid are of rectangular shape.

**Properties:**

- 8 vertices
- 6 surfaces
- 12 edges



**Key Fact**

- 2-D figure have only, length and width.
- 3-D shapes have length, width, and height.
- All 3-D shapes are made by combining 2-D figures.



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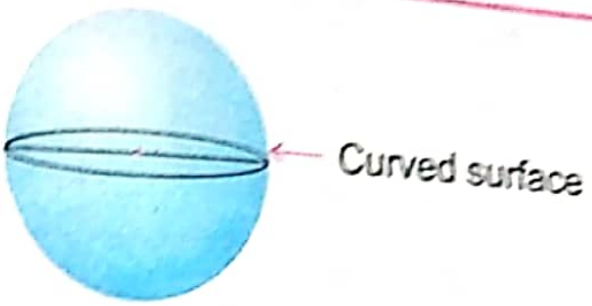
...s a sphere. It has a curved surface. It does not have vertices and ...

**Properties:**

- 0 vertices
- 1 surface
- 0 edges

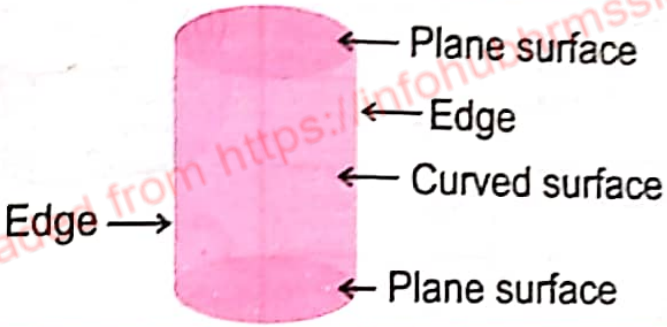



...inder:

...s a cylinder. It has three surfaces, one curved and the ...plane (circular).

**Properties:**

- 0 vertices
- 3 surfaces
- 2 edges

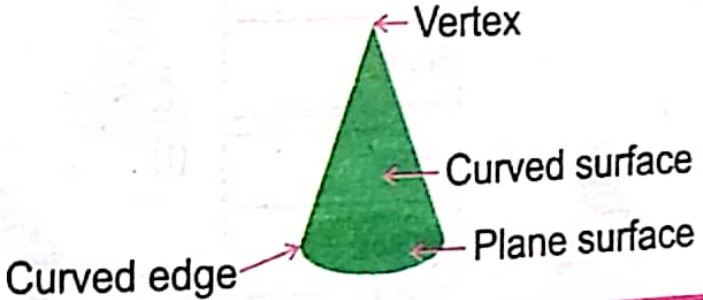



...e:

...s a cone. It has two surfaces, one curved and the other ...e (circular).

**Properties:**

- 1 vertex
- 2 surfaces
- 1 edge




Give flash cards of different figures to the students and ask them to sort of 3-D figures from them. Ask the students to write their names as well and compare their properties.



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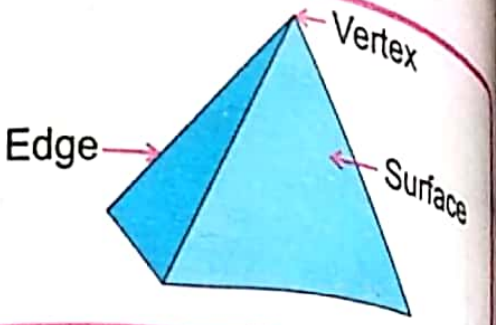
**Pyramid:**

This is a pyramid with base as a square. It has five surfaces, one square and four triangular.

**Properties:**

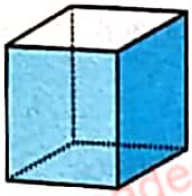
- 5 vertices
- 5 surfaces
- 8 edges




## Exercise 6

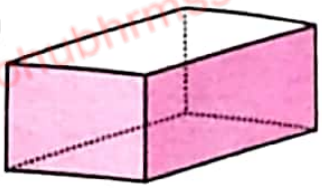
1. Write the names of these figures and label their vertices, edges, and surfaces.

(a)



Name:
Vertices:
Edges:
Faces:

(b)



Name:
Vertices:
Edges:
Faces:

(c)

Name:
Vertices:
Edges:
Faces:

(d)

Name:
Vertices:
Edges:
Faces:

(e)

Name:
Vertices:
Edges:
Faces:

(f)

Name:
Vertices:
Edges:
Faces:

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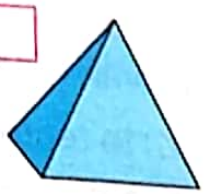
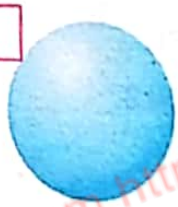
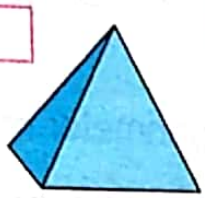
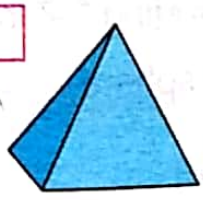
Tick (✓) the figure which has the given properties.

| Properties | 3-D shapes | | |
|---|---|---|---|
| • 0 vertices<br>• 3 surfaces<br>• 2 edges | ☐ | ☐ | ☐ |
| • 8 vertices<br>• 6 flat surfaces<br>• 12 edges | ☐ | ☐  | ☐ |
| • 0 vertices<br>• 1 surface<br>• 0 edges | ☐  | ☐ | ☐ |
| • 5 vertices<br>• 5 surface<br>• 8 edges | ☐ | ☐  | ☐ |
| • 1 vertex<br>• 2 surfaces<br>• 1 edge | ☐ | ☐ | ☐ |
| • 8 vertices<br>• 6 rectangular surfaces<br>• 12 edges | ☐ | ☐  | ☐ |

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## I have learnt to:

- recognize and identify parallel and non-parallel lines.
- recognize an angle formed by intersection of two rays.
- measure angles in degree (°) by using protractor.
- draw an angle of given measurement and use the symbol (∠) to represent it.
- differentiate acute, obtuse and right angles.
- measure angles using protractor.
- Identify right angles in 2-D shapes.
- describe radius, diameter and circumference of a circle.
- find perimeter of a 2-D figures on a square grid.
- recognize that perimeter is measured in units of length.
- find area of 2-D figures on a square grid.
- recognize that the area of a square is measured in metre square ($m^2$) and centimetre square ($cm^2$).
- recognize lines of symmetry in two-dimensional (2-D) shapes.
- complete a symmetrical figure with respect to a given line of symmetry on square grid/dot pattern.
- compare and sorting 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere).

**Vocabulary**

- Parallel lines
- Non-parallel lines
- Angle
- Right angle
- Acute angle
- Obtuse angle
- Symmetry
- 3-D shapes
- 2-D shapes
- Sphere
- Cube
- Cylinder
- Cuboid
- Cone
- Pyramid

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# Review Exercise

(✓) the correct option.

The lines which keep going straight and never meet each other are called:

horizontal lines (ii) vertical lines

non-parallel lines (iv) parallel lines

There are _____ small parts in a protractor and each part is equal to 1 degree.

150 (ii) 120 (iii) 180 (iv) 360

When horizontal and vertical lines intersect each other at a point, they form:

right angles (ii) obtuse angles

acute angles (iv) horizontal angles

An angle less than _____ is called acute angle.

90° (ii) 80° (iii) 100° (iv) 180°

The length of boundary a circle is called _____ of the circle.

circumference (ii) centre (iii) diameter (iv) radius

The area covered by a closed figure is the _____ of that figure.

length (ii) side (iii) perimeter (iv) area

Line of symmetry divides a figure into _____ equal parts.

5 (ii) 4 (iii) 3 (iv) 2

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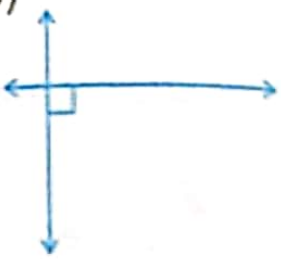
2. Encircle the parallel lines from the given lines.

(a)

(b)



(c)

3. Differentiate right, acute and obtuse angle in the following:

(a)

(b)

(c)

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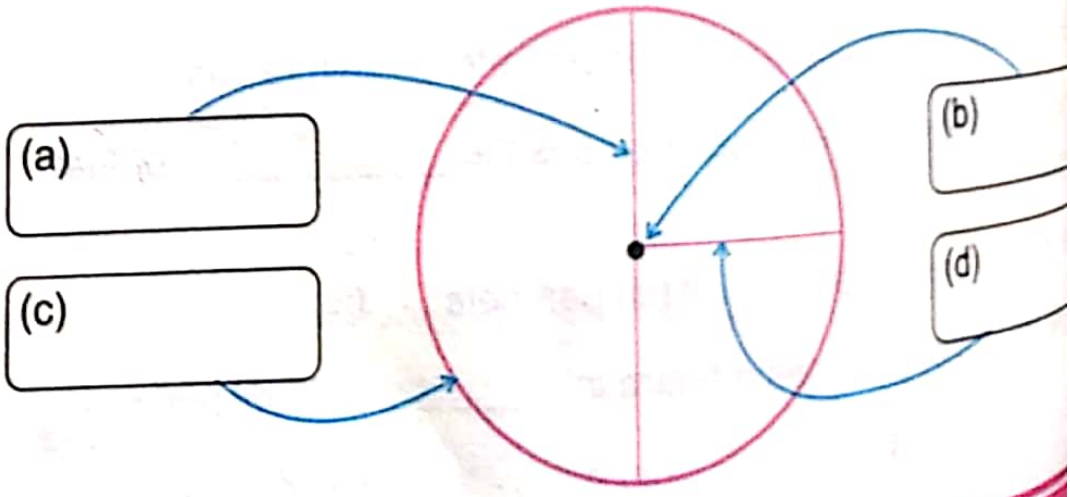
4. Draw the angles of the given measurements.

(a) 135° (b) 95° (c) 70° (d) 20°

5. Label the circle.



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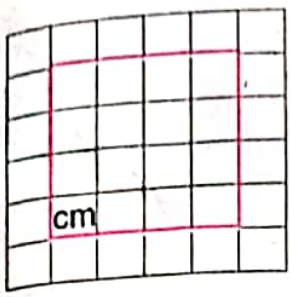
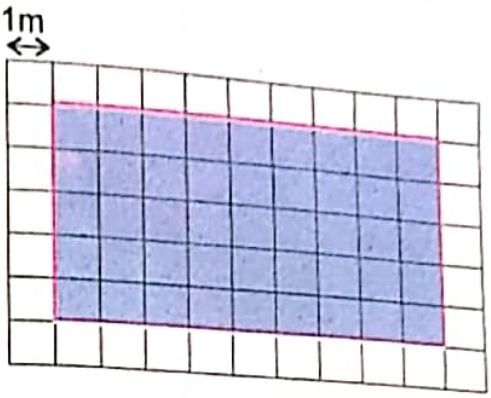
perimeter and area of the given figures.

(b)

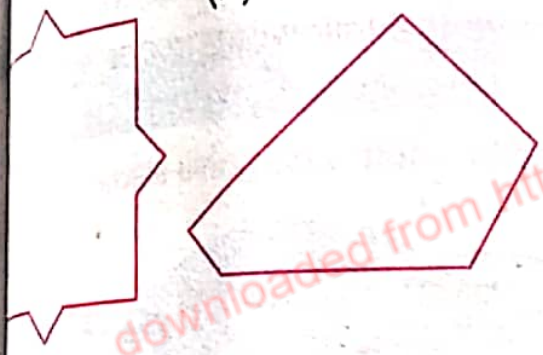
(c)



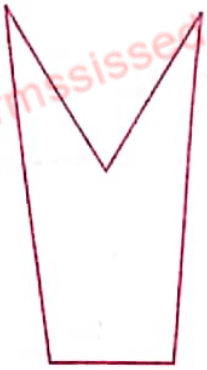

the symmetry in the given figures and draw lines of symmetry, possible.

(b)



(c)

(d)



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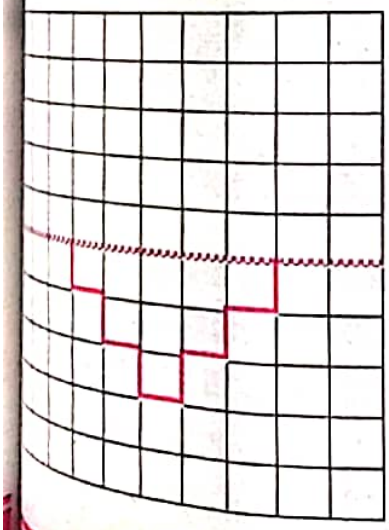
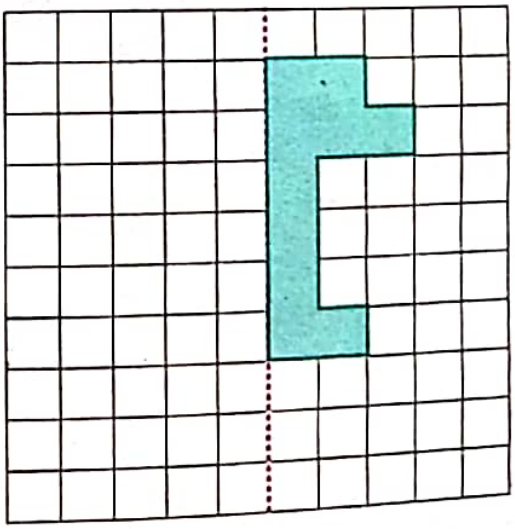
plete the given figures.



(b)





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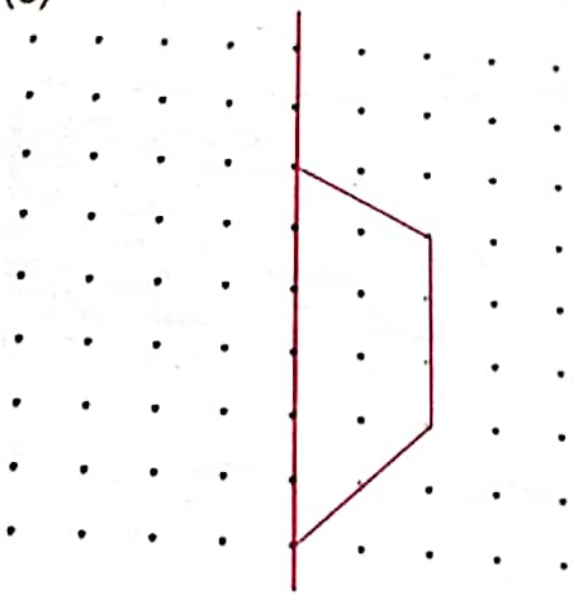
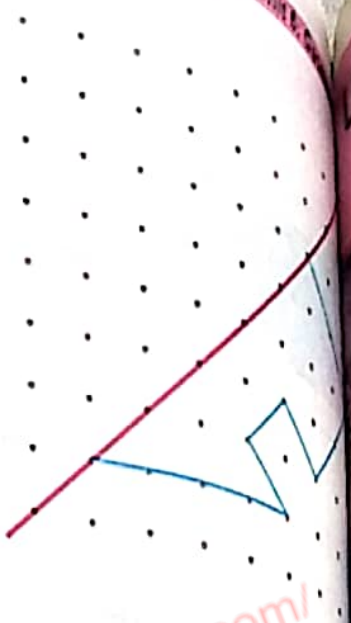
(c)

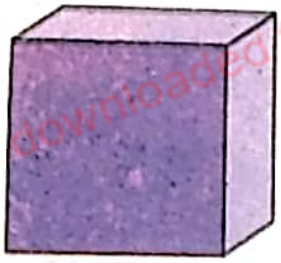


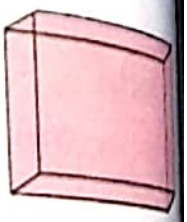
(d)



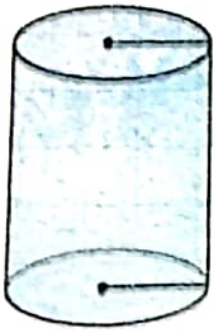
9. Encircle the figures which have the following properties:

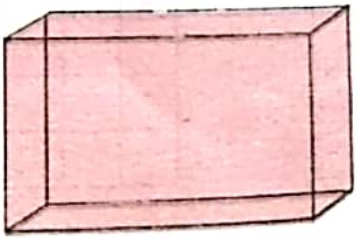
(a) 6 plane surfaces





(b) 1 vertex





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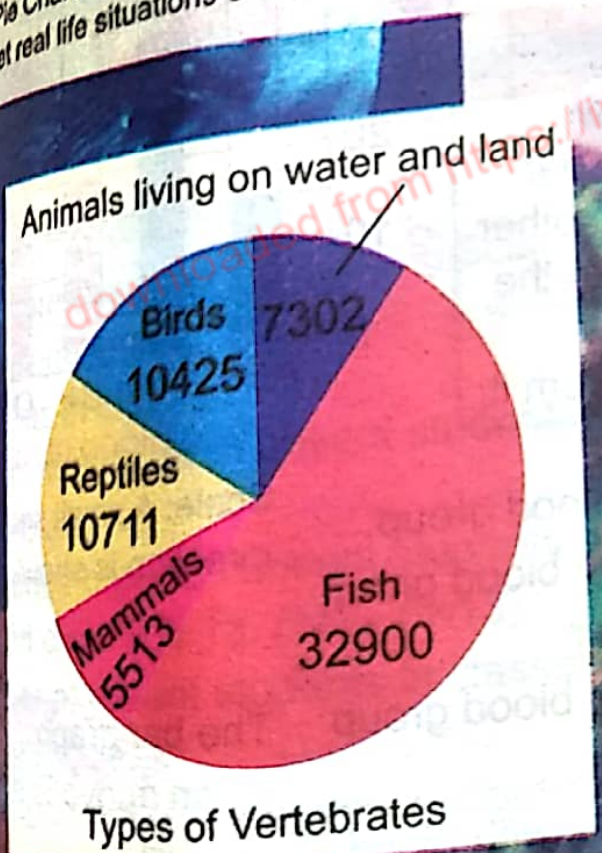
# Data Handling

## Learning Outcomes

**After completing this unit, you will be able to:**

- Read simple bar graphs given in horizontal and vertical form.
- Interpret real life situations using data presented in bar graphs.
- Read line graph.
- Interpret real life situations using data presented in line graphs.
- Read Pie Chart.
- Interpret real life situations using data presented in a Pie Chart.




The chart given above shows the types and number of vertebrates. By looking at the chart, can you write these types in the ascending order of their number?

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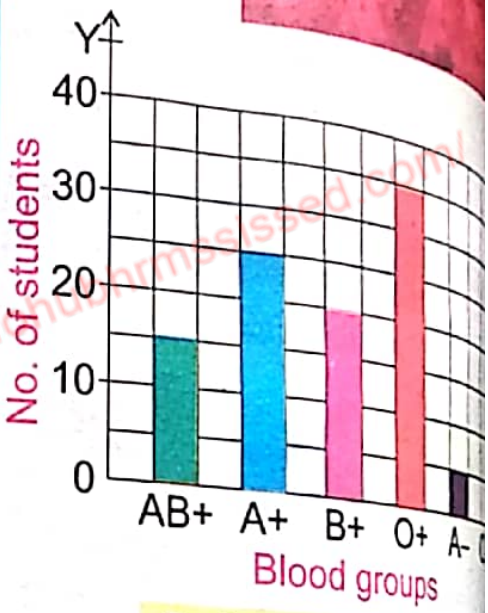
# Bar Graph

Nida did a survey of three sections of her class in which she asked about the blood groups of students. She has prepared a bar graph based on this information. How can we read this graph?

In the vertical direction of this graph, a small square is representing 5 students. If we look at each bar one after the other, we can obtain the following information from it:




Scale: A small square in ver direction is showing 5 stud

- No students have O– blood group.
- The students having O+ blood group are maximum in number.
- The students having A– blood group are minimum in number.
- Total number of students with blood groups A+ and AB+ is 40
- 20 students have blood group B+.
- Nida collected information of 100 students.

The bar graph given above is a vertical bar graph. Similarly, a horizontal bar graph can be drawn as well.



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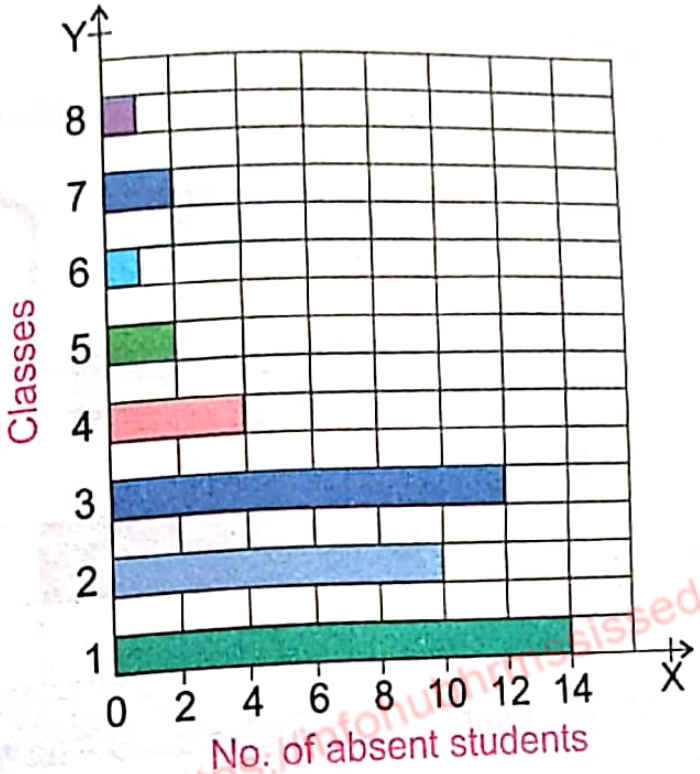
wing graph is about the students who were absent from school
e months.
aph, the bar is horizontal. That is why it is called a horizontal
ph.




Scale: A small square in horizontal direction is showing 2 students.

**Key Fact**
e width of each
r in a bar graph
same.

n obtain the following
tion from this graph:
maximum number of absent
ents was in class 1.
minimum number of absent students was
asses 6 and 8.
difference between absent students of
ss 1 and class 8 is 13. (14 – 1 =13)
number of absent students in classes 5
d 7 is same, i.e. 2.
number of absent students in classes 6
d 8 is same, i.e. 1.
information of 46 students in total is
wn in this bar graph.

**Try Yourself**

In which classes, difference between the number of absent students is the least?

Draw graphs about favourite subjects, foods, hobbies of students and ask questions about them.



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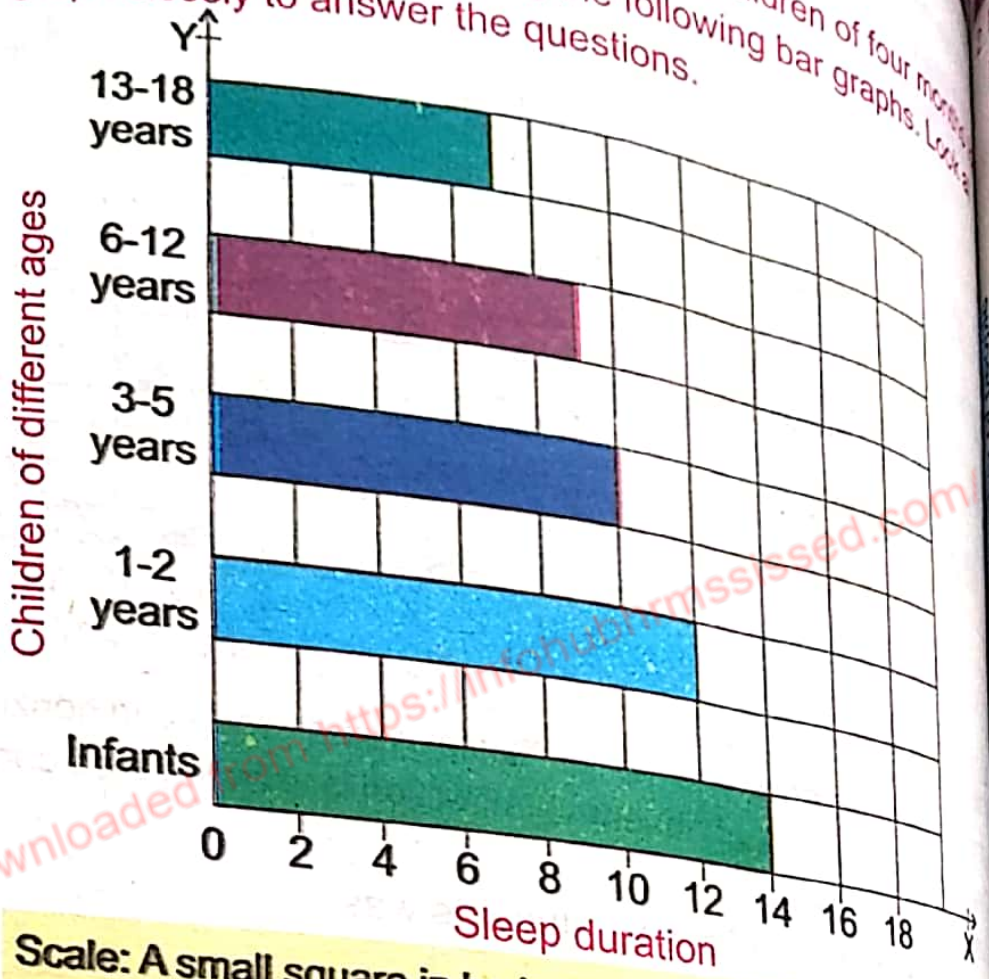
## Exercise 1



1. The minimum time for suggested sleep for children of four ranges eighteen years is shown by using the following bar graphs. Look the graph closely to answer the questions.

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**Scale: A small square in horizontal direction is equal to 2 hours.**

(a) For the children of 6 to 12 years, suggested time duration of sleep is _____.

(b) For which age group, the time duration of sleep is maximum? _____ and how much? _____

(c) The sleep duration for the children of age 13 to 18 years is ___ hours less than the sleep duration for children of age 3 to 5 years.

(d) For which age group the time duration for sleep is minimum and how much? _____.



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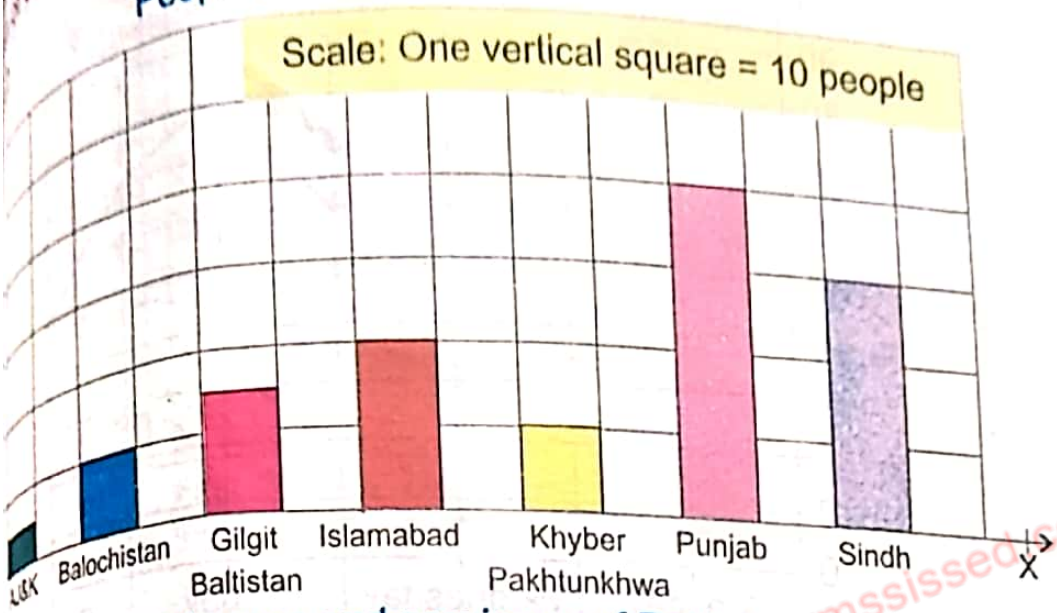
2020, people from different areas and provinces of Pakistan
ticipated in games. The number of participants is shown with the
of this bar graph. Read the graph and answer the questions.

People participating in games




Different areas and provinces of Pakistan

The maximum number of people are from _____ and their quantity is _____.

The minimum number of people are from _____ and their quantity is _____.

From which cities 30 people participated?

In which two provinces the people are of the same quantity?

What is the total number of people who participated in the games?

## Line Graph

The number of people who came in a masjid everyday to offer Zuhr Salah for a week is represented by this graph. What type of graph is it and what information can we obtain from this graph?

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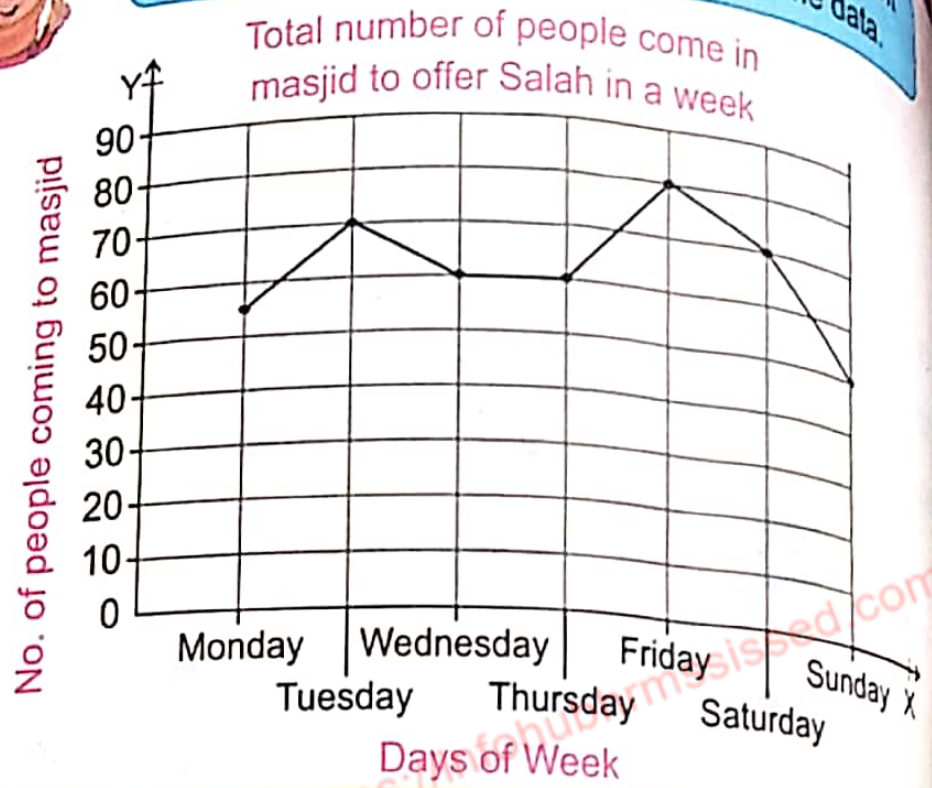
This is a line graph. It is drawn by joining different points which represent the values of some data.




Scale: A small square in vertical direction is representing 10 people who came to the mas

By reading this line graph, we can find out easily that how many peop came to offer Salah and on which day.

(a) 55 people came to offer Salah on Monday.

(b) On Tuesday, 70 people came while on Wednesday 60 people cam to offer Salah.

(c) The least number of people came to offer Salah was on Sunday wh were only 50.

(d) The maximum number of people, i.e. 80 came on Friday.

**Key Fact**

Usually, a line graph represents data which changes with time.

Tell the students how to read a line graph with the help of examples. Familiarize them with the concept of scale and tell them to read the scale of a graph.



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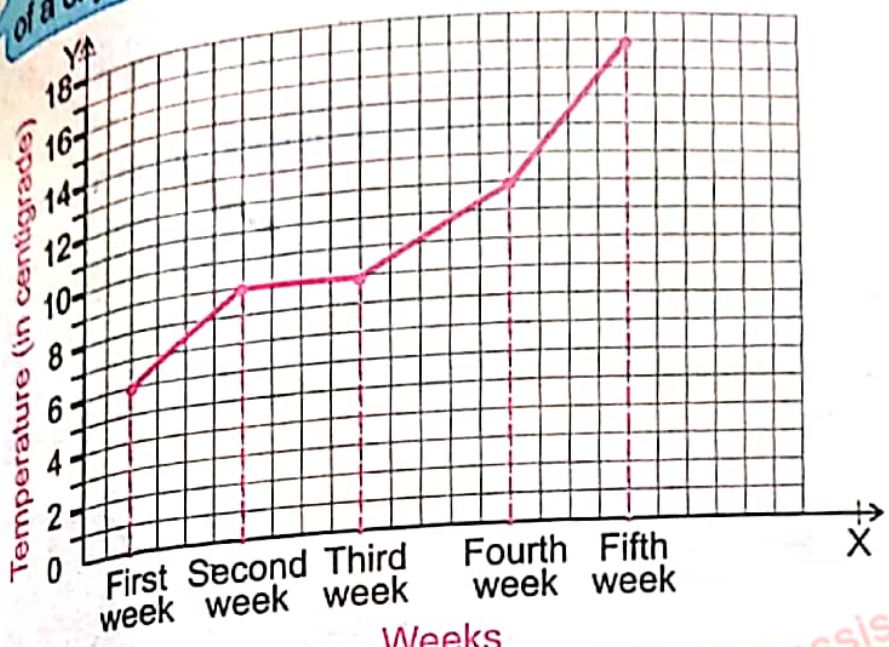
A graph is drawn with the help of maximum temperatures of a city during 5 weeks.




A small square in vertical direction is representing 1 degree centigrade.

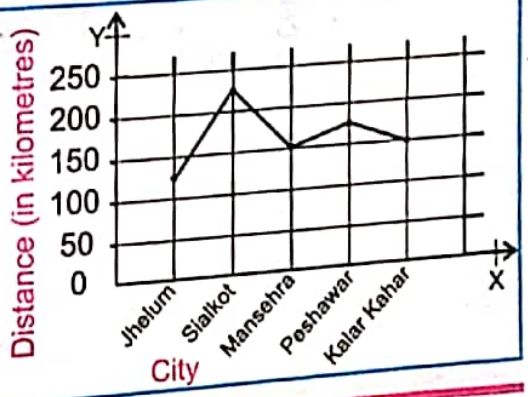
From the graph, we can see that:

- except the second and third week, the temperature throughout the week has increased gradually.
- the second and third week, the temperature remained the same, i.e. 8 degree centigrade.
- the minimum temperature was recorded in the first week, i.e. 6 degree centigrade.
- the maximum temperature was recorded in the fifth week, i.e. 17 degree centigrade.
- in five weeks, the difference between the maximum and minimum temperatures is 11 degree centigrade.

## Try It!

Observe the given line graph and find the mistake in it.

| | Jhelum | Sialkot | Mansehra | Peshawar | Kalar kahar |
|---|---|---|---|---|---|
| Distance from Rawalpindi in kilometres | 125 | 275 | 150 | 175 | 150 |



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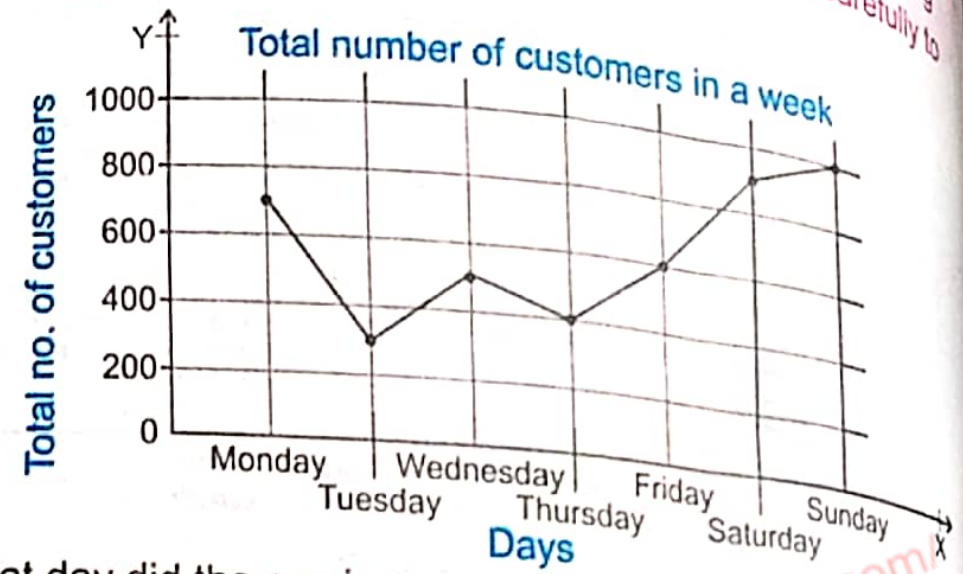
## Exercise 2

1. In a superstore, the number of customers who came for shopping for a week, is shown in this line graph. Read the graph carefully to answer the given questions.



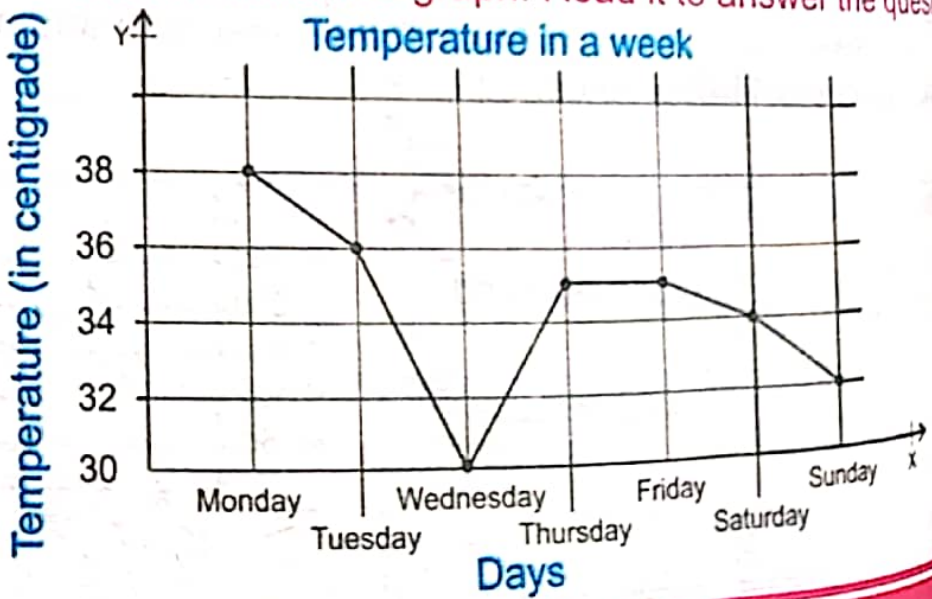

(a) On what day did the maximum number of customers come and how many?

(b) Is the total number of customers coming on Monday and Thursday more or less than the number of customers coming on Sunday?

(c) On what day did the minimum number of customers come and how many?

(d) How many customers came on Friday.

2. During a week of August, the maximum temperature (in centigrade) in Peshawar is shown in this line graph. Read it to answer the questions



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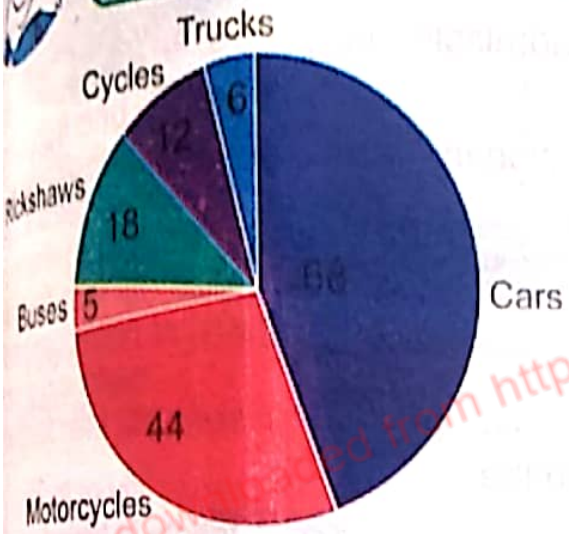
(c) On what day the temperature was the highest?
(d) On which two days had the same temperature and how much?
(e) What was the lowest temperature and on what day?
(f) What was the temperature on Friday?

## Pie Chart

The types of traffic that passed on the road near my house during ten minutes, the information regarding this is given below by using pie chart.




Pie chart

**Key Fact**

A pie chart is also called a circle graph. It can be divided into many sectors and each sector represents only one type of thing.

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Pie chart is also used for to organize and represent the given information. In this chart, we represent the obtained information by using the sectors of a circle.

this pie chart, we can see that:
During 10 minutes, the most frequently passing vehicle is a car which is shown by the blue sector.
Motorcycle is the second most frequently passing vehicle.
Only a few trucks passed, i.e. 6 and buses passed in the least number, i.e. 5.
Rickshaws and cycles passed in the numbers of 18 and 12, respectively.
By looking at this chart we can find that during 10 minutes a total of 153 vehicles passed from this road.



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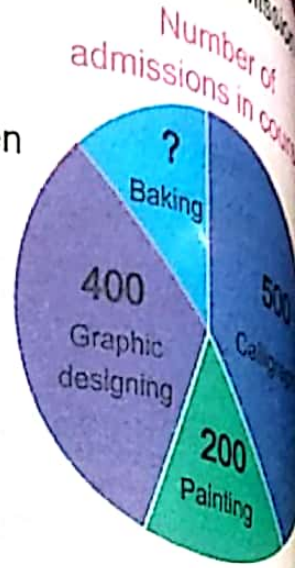
In the following pie chart, information of 1250 people taking admission in different courses during a vacation is shown.




(a) The most number of admissions were taken in calligraphy.

(b) The least number of admissions were taken in baking.

$= 1250 - (500 + 200 + 400)$

$= 1250 - 1100$

$= 150$

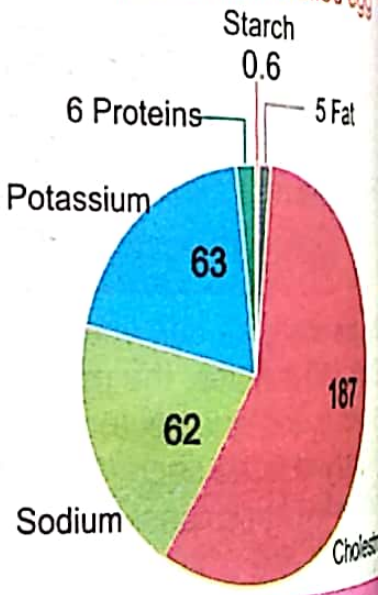
So, 150 people got admission in the baking course.

(c) What fraction of people got admission in graphic designing.

Fraction of people getting admission in graphic designing $= \frac{400}{1250} = \frac{8}{25}$

## Exercise 3

1. The food components present in a boiled egg are shown in this pie chart. Read the chart carefully to answer the given questions.




(a) What is the quantity of fat in the boiled egg?

(b) What component is present in the most amount?

(c) What is the total quantity of fat and proteins?

(d) How much less is the quantity of proteins than the quantity of sodium?

(e) What is the component that is present in the least amount in a boiled egg?

TEACHING POINT

Tell the students the method of reading a pie chart with the help of different examples. Tell them that a complete pie chart represents a 'total' and its sectors represent different parts of that "total.



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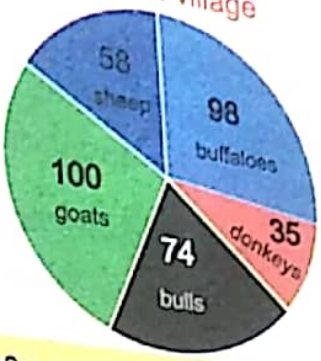
...vey in a village was carried out to find what cattle are bred by ...people of the village.

...ch cattle is bred the most?
...ch cattle is bred the least?
...e total number of sheep and goats more ...ss than the total number of donkeys and ...ffaloes, and how many more or less?
...ite in the form of fraction, what part is the ...mber of bulls to the total number of cattle?




## I have learnt to:

...d simple bar graphs given in ...zontal and vertical form.
...erpret real life situations using ...a presented in bar graphs.
...d line graph.
...erpret real life situations using ...a presented in line graphs.
...d a pie chart.
...erpret real life situations using data presented in a pie chart.

**Vocabulary**

- Data
- Bar Graph
- Horizontal Bar Graph
- Vertical Bar Graph
- Line Graph
- Pie Chart
- Sector

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## Review Exercise

...(✓) the correct option.

...t is important that in a bar graph, the _____ of each ...is same.

...ength (ii) colour (iii) width (iv) value

...Bar graphs can be of _____ types.

...wo (ii) three (iii) four (iv) five

_____ is also called a circle graph.

...Pie chart (ii) Line graph

...Vertical bar graph (iv) Horizontal bar graph

_____ is drawn by joining the dots representing the ...antity of a given value in the question.

...Pie chart (ii) Line graph

...Vertical bar graph (iv) Horizontal bar graph



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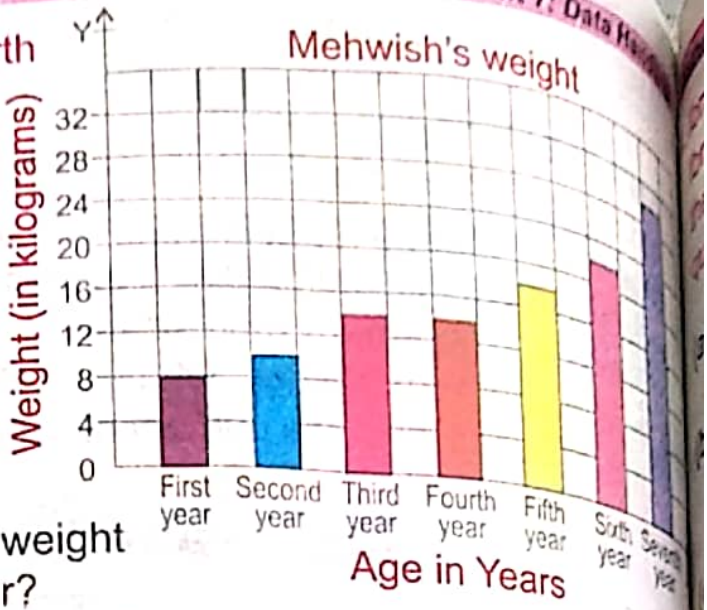
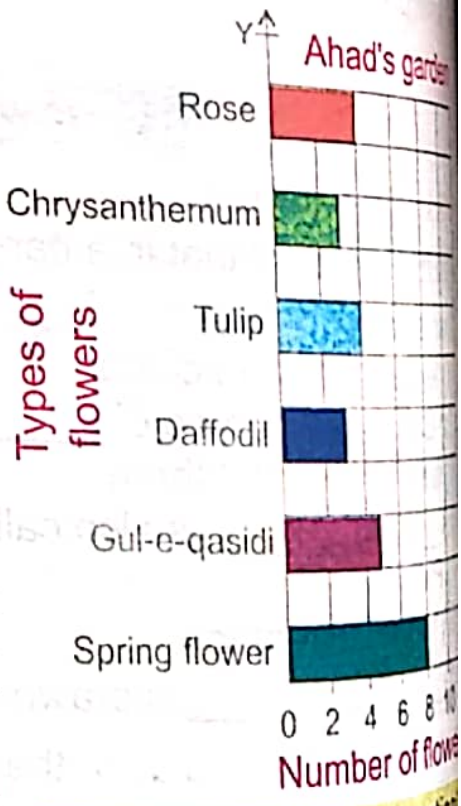
2. Mehwish's weight from birth to 7 years is shown in the following bar graph. Read the graph to answer the questions.

Scale: One square in vertical direction is representing 4kg.




(a) What was Mehwish's weight at the age of one year?
(b) In what years Mehwish's weight was same and how much?
(c) What was the age duration in which Mehwish's weight increased the most and how much?
(d) What was the age duration in which Mehwish's weight increased the least and how much?
(e) How much did Mehwish's weight increase in total from the age of 1 year to 7 years?

3. Ahad has planted different flowers in his garden. Their number and type is shown in this bar graph. Read the graph to answer the questions.




(a) How many roses are there in Ahad's garden?
(b) How much less are the tulips than the Gul-e-qasidi?
(c) Which flowers are present in the most number in Ahad's garden and how many are they?
(d) Write in fraction form the number of tulips as compared to the total number of all the flowers.
(e) Which flowers are present in the least number and how many are they?

Scale: One square in vertical direction is representing 2 flowe

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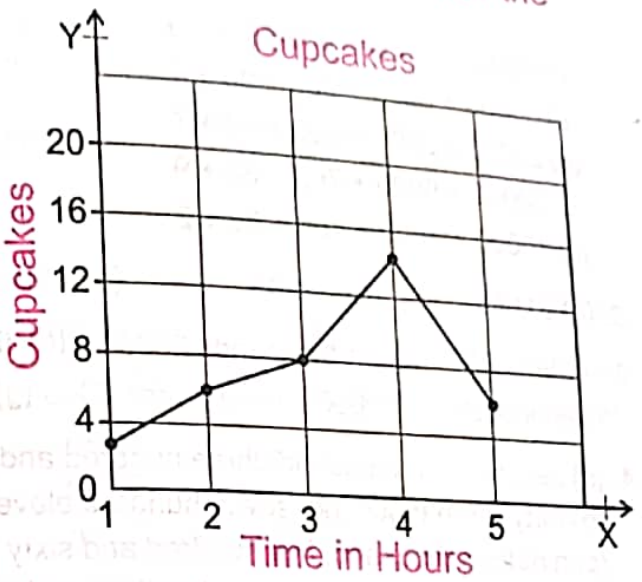
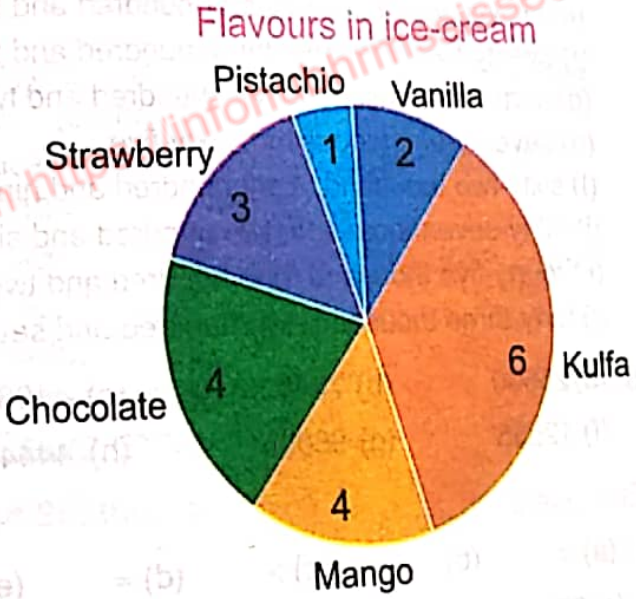
...n set up a stall of cupcakes on the spring festival of his school. ...n drew a line graph of the cupcakes sold in each hour from 9 in ...rning to 2 in the afternoon. Look at the graph to answer the ...stions.




a) How many cupcakes were sold in the third hour?
b) In which hour were the most cupcakes sold and what was their number?
c) In which two hours were same number of cupcakes sold? What was their number?
d) How many cakes were sold in the first hour?

...am asked 20 members of ...s family about their favourite ...ours of ice-cream. Arham ...pared a pie chart based on ...e answers given by all the ...ily members.




a) How many people like vanilla ice-cream?
b) Which flavour is liked the most?
c) Which flavour is liked by the same number of people and how many?
d) How much less are the number of people preffering pistachio ice-cream than the number of people preffering kulfa ice-cream?
e) There are 20 family members in total while people preffering chocolate ice-cream are 4. How will you show this number as a fraction?



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# (Answers)

## Unit 1 Whole Numbers

### Exercise 1

1. (a) 70000 + 5000 + 400 + 30 + 2
   (b) 30000 + 7000 + 900 + 10 + 1
   (c) 10000 + 0000 + 900 + 50 + 6
   (d) 40000 + 6000 + 700 + 40 + 3
   (e) 80000 + 6000 + 500 + 90 + 4
   (f) 00000 + 9000 + 200 + 20 + 3
   (g) 20000 + 2000 + 100 + 60 + 7
   (h) 50000 + 7000 + 800 + 90 + 0
   (i) 30000 + 6000 + 700 + 80 + 9
   (j) 70000 + 8000 + 300 + 20 + 4
   (k) 40000 + 1000 + 400 + 50 + 2
   (i) 50000 + 6000 + 400 + 30 + 2

2. (a) 21171 (b) 39235 (c) 65343 (d) 56790

3. (a) tens 00 (b) ten thousands 20000 (c) thousands 4000 (d) ones 6
   (e) ten thousands 70000 (f) thousands 8000 (g) hundreds 500 (h) thousand 6000

4. (a) seventy-four thousand, three hundred and twenty-five
   (b) forty-three thousand, seven hundred eleven
   (c) nineteen thousand, five hundred and sixty
   (d) seventy-five thousand, four hundred and thirty-four
   (e) sixty-seven thousand, four hundred and fifty-nine
   (f) twenty-five thousand, three hundred and two
   (g) thirty-six thousand, seven hundred and twenty-one
   (h) seventy-eight thousand, sixty-five
   (I) sixty-two thousand, eight hundred and ninety-seven
   (j) thirty-seven thousand, two hundred and sixty-four
   (k) fourty-five thousand, one hundred and twenty-nine
   (l) forty-three thousand, two hundred and seventy-five

5. (a) 25600 (b) 78402 (c) 41061 (d) 98301
   (f) 12555 (g) 96005 (h) 44444 (i) 88320

### Exercise 2

1. (a) < (b) < (c) > (d) = (e) < (f) > (g) >

2. (a) 97035; 83401; 12337
   (b) 18221; 18017; 13411
   (c) 53358; 49178
   (d) 37923; 36121; 34222
   (e) 36243; 23601; 16483
   (f) 24391; 24012
   (g) 36537; 32531; 28540
   (h) 98754; 89654; 78543

3. (a) 31273; 40131; 40735
   (b) 28211; 30817; 43181
   (c) 58375; 70442
   (d) 22342; 67319; 97323
   (e) 36241; 63283; 83624
   (f) 23634; 43128
   (g) 24085; 59312; 60337
   (h) 84675; 89546; 89675

### Review Exercise

1. (a) ii (b) ii (c) iv (d) iii (e) i (f) iv

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...-three thousand, five hundred and sixty-seven
...-seven thousand, seven hundred and forty-one
...-two thousand and sixteen
...-six thousand, seven hundred and forty-three
...-eight thousand, six hundred and forty-nine
...-five thousand, two hundred and two
...thousand and seven
...-six thousand, nine hundred and fifty
...thousand
...thousand and thirty-two
...-two thousand, nine hundred and one
...-six thousand, four hundred and twenty-seven

...000 + 3000 + 600 + 70 + 2 (b) 70000 + 4000 + 300 + 10 + 1
...0000 + 5000 + 600 + 00 + 9 (d) 60000 + 5000 + 700 + 40 + 3
...0000 + 8000 + 900 + 40 + 5 (f) 90000 + 2000 + 500 + 00 + 2
...0000 + 6000 + 200 + 70 + 2 (h) 60000 + 9000 + 000 + 70 + 8
...0000 + 7000 + 800 + 60 + 9 (j) 30000 + 2000 + 700 + 80 + 6
...0000 + 1000 + 900 + 00 + 2 (l) 60000 + 4000 + 700 + 50 + 3

...3568 (b) 82404 (c) 15600 (d) 21105 (e) 23506 (f) 96125 (g) 76003
...housand 5000 (b) ten thousand 20000 (c) thousand 40000 (d) tens 00
...ises 4 (f) thousand 6000 (g) ten thousand 50000 (h) ten thousand 30000
...4683 (b) 90054 (c) 29104 (d) 16785
... (b) < (c) > (d) > (e) = (f) < (g) > (h) >
...8624, 14601, 12683 (b) 26133, 16283, 14394
...3536, 23913, 22480 (d) 54790, 54788, 54786
...2731, 8405, 94041 (b) 12921, 14131, 19375
...7358, 42876, 45037 (d) 35242, 36172, 37723

## Addition and Subtraction

...se 1

...6342 (b) 39970 (c) 92507 (d) 59880
...35501 (b) 91190 (c) 187620 (d) 120784 (e) 155500 (f) 153075
...30652 (h) 124508 (i) 122846 3. Rs 72105 4. 104299
...6225 (b) 89115 books 6. (a) 55388 (b) second month

...se 2

...3196 (b) 22459 (c) 69303 (d) 49228 (e) 18872 (f) 7037 (g) 22782 (h) 34939
...2402 (b) 36111 (c) 32170 (d) 8588 (e) 11420 (f) 5078
...a 36617 (b) Rs 33731 4. 21907 5. Rs 3094 6. 24297



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## Review Exercise

1. (a) iii (b) iii (c) i (d) iv (e) iii (f) 7037
2. (a) 122275 (b) 106390 (c) 91413 (d) 26108 (e) 60792 (f) 25027
3. (a) 57579 (b) 38033 (c) 129733 (d) 23380 (e) 2081 (f) 20158
4. (a) 58023 people (b) 11111 first week 5. (a) 46912 cattle
6. 13641 trees 7. Rs 24086

# Unit 1 Multiplication and Division

## Exercise 1

1. (a) 2524 (b) 15085 (c) 261454 (d) 5455188 (e) 4150146 (f) 2
(g) 1196430 (h) 19242318 (i) 2630226
2. 724983m 3. (a) Rs 4031425 (b) Rs 8062850 4. 4228140 books
5. Rs 11783820

## Exercise 2

1. (a) 195 (b) 454 (c) 166 (d) 343 (e) 416 (f) 311 (g) 239 (h) 231
(j) 132 (k) 21 (l) 111 (m) 612 r5 (n) 89 r13
2. 52 blankets 3. 41 rows 4. 276 biscuits 5. 202 books
(b) Rs 57400 (c) Rs 7895 7. (a) 45 kg (b) 1710 kg 6. (a) Rs

## Exercise 3

1. (a) 3135 by adding 4 (b) 180210 by adding 30 (c) 3642 by adding 6
(d) 600550 by subtracting 50 (e) 9188 subtracting 3 (f) 300304 by adding 4
(g) 480460 by subtracting 20
3. (a) adding 4 (b) adding 20

## Review Exercise

1. (a) iv (b) iii (c) iv (d) ii
2. (a) 490 (b) 8916 (c) 177284 (d) 16185 (e) 23271285 (f) 25
3. (a) 76 (b) 16 r4 (c) 487 r3 (d) 54 (e) 80 r6 (f) 45
4. 21 buses
5. (a) 56 km (b) 616 km 6. (a) Rs 562848 (b) Rs 844272 7. 6687 blocks
8. (a) 2733 adding 6 (b) 5040 subtracting 10 (c) 4248 adding 6 (d) 4250
(e) 5140 subtracting 11

# Unit 2 Factors and Multiples

## Exercise 1

1. a, c, d, f, g, i, j 2. b, c, e, f, g, h 3. a, b, e, g, h

## Exercise 2

1. 32, 33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49
2. b, d, e, h
3. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
5. (a) 12, 6, 4, 3, 2, 1 (b) 15, 5, 3, 1 (c) 32, 16, 8, 4, 2, 1 (d) 10, 5, 2, 1
(f) 22, 11, 2, 1 (g) 6, 3, 2, 1 (h) 49, 7, 1 (i) 40, 20, 10, 8, 5, 4, 2, 1
6. (a) 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 (b) 5, 10, 15, 20, 25, 30,
(c) 8, 16, 24, 32, 40, 48, 56, 64, 72, 80 (d) 2, 4, 6, 8, 10, 12, 14,

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14, 21, 28, 35, 42, 49, 56, 63, 70

8, 12, 16, 20, 24, 28, 32, 36, 40

(f) 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

(h) 9, 18, 27, 36, 45, 54, 63, 72, 81, 90

ise 3

17,1 (b) 3,7 (c) 2,17 (d) 2,3,3 (e) 11,2,2 (f) 11,3 (g) 2,2 (h) 7,2 (i) 2,2,2,2,3 (j) 3,13

1,2,3,6 (b) 1,2,5,10 (c) 1,2 (d) 1,2 (e) 1,7 (f) 1,5 (g) 1,2,4 (h) 1,13 (i) 1

15 (b) 36 (c) 60 (d) 132 (e) 16 (f) 102 (g) 14 (h) 30 (i) 10

Exercise

iv (b) i (c) iii (d) ii (e) ii

2 (b) 2 (c) 3 (d) 2,5,10 (e) 2,3,5,10 (f) 2

2,5,10 (h) 2

6,8,9,10,12,14,15,16,18,20,21 4. 23,29,31,37,41,43,47,53,59 5. (a) 1,2,5,10 (b) 1,5,25

5,7,35 (d) 1,2,23,46 (e) 1,23 (f) 1,2,4,8,16 (g) 1,2,4 (h) 1,47 (i) 1,2,19,38 (j) 1,2,4,5,10,20

2,4,6,8,10,12 (b) 6,12,18,24,30,36 (c) 5,10,15,20,25,30 (d) 9,18,27,36,45,54

5 (b) 19 (c) 2,11 (d) 3,5 (e) 2,2,2,5 (f) 3,7 (g) 2,2,2 (h) 2,3,5 (i) 41 (j) 2,19

2 (b) 2,4 (c) 2,7 (d) 17 (e) 2,3 (f) 5

14 (b) 30 (c) 252 (d) 30 (e) 60 (f) 60

ise 1

## Unit 3 Fractions

= (b) < (c) < (d) < (e) < (f) < (g) > (h) <

$\frac{1}{5}$ (b) $\frac{1}{6}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$ (e) $\frac{3}{4}$ (f) $\frac{3}{5}$ (g) $\frac{2}{3}$ (h) $\frac{2}{9}$ (i) $\frac{7}{10}$ (j) $\frac{1}{2}$

, e, d = mixed number 5. (a) $1\frac{3}{5}$ (b) $2\frac{1}{5}$ (c) $1\frac{3}{10}$ (d) $2\frac{2}{9}$ (e) $7\frac{1}{2}$

, i = proper fractions 6. (a) $\frac{13}{5}$ (b) $\frac{47}{6}$ (c) $\frac{29}{7}$ (d) $\frac{58}{11}$ (e) $\frac{19}{3}$ (f) $\frac{30}{13}$

$\frac{3}{9}, \frac{3}{7}, \frac{3}{5}$ ascending order $\frac{3}{5}, \frac{3}{7}, \frac{3}{9}$ descending order

$\frac{1}{3}, \frac{3}{4}, \frac{6}{7}$ ascending order $\frac{6}{7}, \frac{3}{4}, \frac{1}{3}$ descending order

$\frac{2}{10}, \frac{4}{15}, \frac{3}{5}$ ascending order $\frac{3}{5}, \frac{4}{15}, \frac{2}{10}$ descending order 8. $3\frac{1}{2}$ 9. $\frac{3}{2}$ kg

ise 2

$\frac{11}{7}$ (b) $\frac{22}{13}$ (c) $\frac{16}{17}$ (d) 1 (e) $\frac{5}{8}$ (f) $\frac{14}{19}$

$\frac{1}{3}$ (b) $\frac{6}{11}$ (c) $\frac{1}{3}$ (d) $\frac{8}{21}$ (e) $\frac{2}{5}$ (f) $\frac{2}{5}$ (g) $\frac{1}{13}$ (h) $\frac{2}{15}$

$\frac{10}{13}$ (b) $\frac{4}{13}$, first day 4. $\frac{12}{14} = \frac{6}{7}$ 5. $\frac{9}{10}$ hours 6. Omer's share, $\frac{3}{11}$

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## Exercise 3

1.(a) $\frac{24}{7}$ (b) $\frac{45}{6} = \frac{15}{2}$ (c)13 (d) $\frac{16}{3}$ (e) $\frac{1}{5}$ f) $\frac{6}{13}$ (g) $\frac{14}{11}$

2. (a) $\frac{3}{2}$ (b) $\frac{9}{22}$ (c) $\frac{45}{68}$ (d) $\frac{325}{28}$ (e) $\frac{55}{162}$ (f) $\frac{410}{231}$

3. (a) $\frac{7}{40}$ (b) $\frac{2}{75}$ (c) $\frac{4}{63}$ (d) $\frac{7}{27}$ (e) $\frac{1}{8}$ (f) $\frac{1}{28}$ (g) $\frac{1}{4}$

4. (a) $\frac{39}{40}$ kg 5. (a) 10 years 6. (a) $\frac{3}{4}$ packets (b) $\frac{1}{2}$ packets 7 $\frac{55}{4}$ km

## Review Exercise

1.(a)iii (b) i (c) iii (d) iv (e) iv 2. a,d,f 3(a) > (b) > (c) > (d) > 4. (a) $\frac{26}{9}$ (b) $\frac{1}{3}$ (c) $\frac{3}{10}$

5. a,c,d = improper fraction e, b = unit fraction 6. (a) $1\frac{2}{5}$ (b) $1\frac{3}{8}$ (c) $4\frac{1}{4}$ (d) $\frac{1}{4}$

7. (a) $\frac{8}{5}$ (b) $\frac{35}{10}$ (c) $\frac{46}{7}$

8.(a) $\frac{1}{6}, \frac{4}{8}, \frac{6}{7}, \frac{5}{2}$ = ascending order $\frac{5}{2}, \frac{6}{7}, \frac{4}{8}, \frac{1}{6}$ = descending order

(b) $\frac{2}{9}, \frac{1}{3}, \frac{5}{6}, \frac{8}{9}$ = ascending order $\frac{8}{9}, \frac{5}{6}, \frac{1}{3}, \frac{2}{9}$ = descending order

(c) $\frac{3}{10}, \frac{4}{12}, \frac{7}{18}, \frac{5}{6}$ = ascending order $\frac{5}{6}, \frac{7}{18}, \frac{4}{12}, \frac{3}{10}$ = descending order

9. (a) $\frac{3}{3} = 1$ (b) $\frac{3}{2}$ (c) $\frac{13}{5}$ (d) $\frac{10}{9}$ 10. (a) $\frac{3}{5}$ (b) $\frac{6}{13}$ (c) $\frac{5}{17}$ (d) $\frac{1}{7}$

11.(a) $\frac{63}{5}$ (b) $\frac{207}{55}$ (c) $\frac{71}{18}$ (d) $\frac{95}{22}$ (e) $\frac{55}{6}$ (f) $\frac{1}{54}$ (g) $\frac{55}{12}$ 12. $\frac{4}{3}$ tree 13. $\frac{7}{7}$

14. 80

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# Unit 4 Decimals

## Exercise 1

1. (a) 0.16 (b) 0.1 (c) 0.324 (d) 0.02 (e) 0.070

2.(a) 0.5 (b) 0.08 (c) 300 (d) 0.09 (e) 0.00 (f) 2 (g) 0.008 (h) 0.0

4.(a) (i) 1,7 (ii) 0.1, 0.4, (iii) 0.01, 0.05 (b) (i) 10, 20 (ii) 1, 6

(c) (i) 10, 80 (ii) 1, 7 (iii) 0.1, 0.3 (iv) 0.01, 0.09 (v) 0.001, 0.001

(d) (i) 10, 90 (ii) 1, 9 (iii) 0.1, 0.9 (iv) 0.01, 0.09 (v) 0.001, 0.009

## Exercise 2

1. (a) 0.24 (b) 0.005 (c) 0.6 (d) 0.024 (e) 0.012 (f) 1.88 (g) 0.300 (h) 0.606

2.(a) $\frac{13}{10}$ (b) $\frac{51}{25}$ (c) $\frac{349}{50}$ (d) $\frac{11}{2}$ (e) $\frac{17}{25}$ (f) $21\frac{18}{25}$ (g) $7\frac{87}{100}$ (h) $\frac{49}{50}$ (i) $11\frac{11}{100}$

## Exercise 3

1. (a) 17.14 (b) 55.8 (c) 55.1 (d) 8.67 (e) 7.91



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(b)4.48 (c)2.30 (d)1.69 (e)8.71 (f)71.06

4. (a) 3.7kg (b) 81.5kg

(b) 480 (c) 300 (d) 82 (e) 4300 (f) 910

(b) 14.2 (c) 19.6 (d) 10.2 (e) 9.1 (f) 88.2

(b) 0.2 (c) 1.6 (d) 1.4 (e) 0.9 (f) 1.3

5. 20m 6. (a) 1.8m (b) 3.6m 7. 1.7min

(b) 5470,5500,5000 (c) 1210,1200,1000 (d) 6340,6300,6000

(f) 3500,3500,3000 (g) 1290,1300,1000 (h) 4550,4500,5000

(b) 54 (c) 987 (d) 13 (e) 9 (f) 7 (g) 76 (h) 8 (i) 88

(b) ii (c) i (d) ii (e) iv

(b) 0.075 (c) 0.2 (d) 0.19 (e) 0.800

(b) $45\frac{14}{25}$ (c) $1\frac{1}{50}$ (d) $7\frac{87}{100}$ (e) $15\frac{4}{5}$ 4. (a) 11.59 (b) 9.52 (c) 15.94

(b) 1.98 (c) 3.97 6. (a) 13 (b) 890 (c) 4500 (d) 57.4 (e) 27.9 (f) 42.6

(b) 4.4 (c) 0.9 (d) 0.5 (e) 0.8 (f) 1.7

b) 1010,1000,1000 (c) 7820,7800,8000 (d) 8420,8400,8000

(f) 1720,1700,2000 9. (a) 4 (b) 78 (c) 13 (d) 1 (e) 41 (f) 10

(b) 4.15m 11. (a) 23.8ℓ (b) 14ℓ 12. 0.45kg

## Unit 5 Measurements

(b) cm (c) m (d) km

(b) 56930m (c) 8800cm (d) 6078cm (e) 32mm (f) 552mm

(b) 94km 17m (c) 104m (d) 82cm 8mm (e) 41m 30cm

(b) 46km 26m (c) 37m (d) 10cm 4mm (e) 1m 2cm

4. 1400mm 5. (a) 1km 496m (b) 1496m 6. (a) 10m (b) 1m 12cm

(b) 23139g (c) 89000mg (d) 43699mg (e) 1900mg (f) 800g



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2. (a)112kg (b) 35kg 17g (c) 10.4g (d) 82g 562mg (e) 81g 30mg (f) 94kg 14g
3. (a)75kg (b) 29kg 155g (c) 750g (d) 14g 400mg
4. 9g 6mg 5. 114kg 958g, 114958g 6. (a) 22kg 646g (b) 22646g

## Exercise 4

1.(a) 9000mℓ (b) 74000mℓ (c) 56506mℓ (d) 90000mℓ (e) 67000mℓ (f) 1600mℓ
2. 98000mℓ 3. 1700mℓ

## Exercise 5

1. (a) 8ℓ 413mℓ (b) 10.7ℓ (c) 198mℓ (d) 126ℓ 200mℓ (e) 455ℓ 678mℓ
2. (a) 12ℓ 391mℓ (b) 23ℓ (c) 0.7mℓ (d) 1ℓ 118mℓ (e) 62ℓ 67mℓ
3. (a) 151ℓ 498mℓ (b) 17ℓ 102mℓ 4. sells less milk on Saturday, 19800 mℓ

## Review Exercise

1. (a) iv (b) iv (c) iii (d) iv (e) i
2. (a) 105000m (b) 340cm (c) 66000g (d) 40
   (e) 500mg (f) 76002mℓ (g) 9800mℓ (h) 900
3. (a) 14kg 299g (b) 7.3m (c) 159kg 872g (d) 304ℓ 700mℓ (e) 484ℓ 591mℓ (f) 163g 51
4. (a) 89kg (b) 72m 384cm (c) 9kg 31g (d) 15ℓ 591mℓ (e) 53ℓ 12
5. (a) 237m (b) 17km 459m 6. (a) 255kg (b) 255000g 7. 199456mℓ

# Time

## Exercise 1

1. (a) 6:00 a.m. (b) 7:45 a.m. (c) 12:30 p.m. (d) 4:30 p.m. (e) 8:00 p.m. (f) 10:25
2. (a) 7:30:15 (b) 5:30:36 (c) 8:59:58
3. (a) 5:00:15 (b) 5:00:35 (c) 7:40:00 (d) 3:10:00

## Exercise 2

1. (a) 360min (b) 12060min (c) 852min (d) 355min (e) 1048min (f) 1346min (g) 70
   (h) 1335min (i) 583min (j) 1086min (k) 1658min (l) 2546min
2. (a) 4620sec (b) 2580sec (c) 73sec (d) 512sec (e) 413sec (f) 3838sec (g) 53
   (h) 3937sec (i) 12864sec (j) 6011sec (k) 10578sec (l) 25923sec



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...months (b) 48months (c) 144 months (d) 252months (e) 99months (f)64months
...months (h) 214months (i) 371months (j) 355months (k) 191months (l) 523months
...months (b) 56days (c) 35days (d) 175days (e) 69days (f) 50days
...days (h) 31months (i) 228days (j) 813days (k) 1242days (l) 1633days

...hr 29min 45sec (b) 26h 55min 48sec (c) 97hr 39min 55sec
...hr 13min 56sec (e) 21 years 11 months 4 days (f) 88hr 13min 17sec
...8 years 7 months 16 days (h) 59 years 9 months 9 days
...3hr 22min 11sec (b) 24h 11min 15sec (c) 11hr 8min 11sec
...hr 11min 11sec (e) 2 years 2 months 2 days (f) 11hr 11min 21sec
...2 years 1 months 14 days (h) 20 years 0 months 11 days

...hr 43min (ii) 6.403 min 4. (a) 2hr 14min 57sec (b) 10hr 54min 57sec
...hr 13min (b) 16hr 33min

**...r Exercise**

...i (b) iii (c) i (d) iv (e) iv
...5:00a.m. (b) 7:30a.m. (c) 8:00a.m. (d) 12:20p.m. (e) 3:00p.m. (f) 9:25p.m.
...480min (b) 6720min (c) 913min (d) 435min (e) 1719min
...2035min (g) 673min (h) 1396min (i) 414min
...4580sec (b) 1980sec (c) 257sec (d) 582sec (e) 173sec
...1271sec (g) 5867sec (h) 2927sec (i) 26024sec
...2 months (b) 36 months (c) 264 months (d) 384 months (e) 112 months (f) 190 months
...256 months (h) 239 months (i) 657 months
...105 days (b) 63 days (c) 42 days (d) 189 days (e) 79 days (f) 68 days (g) 83 days
...356 days (i) 304 days

...85h 45min 54sec (b) 76h 59min 44sec (c) 9h 38min 49sec
...36h 11min 12sec (b) 12h 13min 21sec (c) 16h 22min 49sec
...9h 43min (b) 403min
...31min 30sec 11. (a) 9 years 11 months 9 days (b) 3579 days
...years 10 months 9 days

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**Exercise 1**
1. parallel = a,c,e non-parallel = b,d,f

**Exercise 2**
1. (a) acute angle (b) right angle (c) obtuse angle (d) acute angle

**Exercise 3**
2. (a) centre = R, diameter = PQ, radius = PR,RQ,RS
(b) centre = L, diameter = JK, radius = LJ,LK
(c) centre = C, diameter = AB, radius = CD,AC,CB

**Exercise 4**
1. (a) 20m (b) 22cm (c) 20m 2. (a) $4cm^2$ (b) $84m^2$ (c) $8cm^2$ (d)

**Exercise 5**
1. a,b

**Review Exercise**
1. (a) iv (b) iv (c) i (d) i (e) i (f) iv (g) iv 2. a 3. (a) acute angle (b) obtuse a
(c) right angle 5. (a) diameter (b) circumfercen (c) centre (d) radius
6. (a) 20m, $24m^2$ (b) 16cm, $16m^2$ (c) 28m, $45m^2$
9. (a) cuboid, cube (b) cone

## Unit 7 Data Handling

**Exercise 1**
1. (a) 9h (b) in fant, 12h (c) 3h (d) 13-18 year children, 7
2. (a) punjab, 40 (b) AJ&K, 5 (c) Sindhd) Balochistan and Khyber Pakhtunkhwa
(e) 130 people

**Exercise 2**
1. (a) Sunday,1000 (b) more, 100 (c) Tuesday,300 (d) 600
2. (a) Monday (b) Thursday and Friday (c) 30°C, Wednesday (d) 35°C

**Exercise 3**
1. (a) 5 (b) cholestrol (c) 11 (d) 56 (e) Starch
2. (a) goats (b) donkeys (c) 25, more (d) $\frac{74}{365}$

**Review Exercise**
1. (a) iii (b) i (c) i (d) ii
2. (a)8kg (b) third and fourth year, 14kg (c) sixth and seventh year, 8kg
(d) first and second year, 2kg (e) 22kg
3. (a)10 (b)1 (c) 8, Spring flower (d) $\frac{4}{27}$ (e) 3, Chrysanthemum
4. (a) 8 cupcakes (b) in fourth hour, 14 (c) second and fifth, 6 (d) 3 cupcakes
5. (a) 2 (b) Qulfa (c) mango, chocolate (d) 5 (e) $\frac{1}{5}$


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# Glossary

**Expanded form:** To write the number as sum of place values is called expanded form.

**Ascending order:** The arrangement of numbers from smallest to the greatest is called ascending order.

**Descending order:** The arrangement of number from greatest to the smallest is called descending order.

**Number pattern:** The number pattern is the sequence of numbers that can increase, decrease and repeat according to some rule.

**Prime numbers:** The number greater than 1 which have two factors, 1 and the number itself. Such numbers are called prime numbers.

**Composite numbers:** The numbers whose factors are more than two, called composite numbers.

**Factors:** When a number completely divide the other number then that number is called factor of that number.

**Multiples:** Multiple is the product when we multiply one number by an other number.

**Prime Factorization:** The process of writing a number as a product of its factors is called factorization. The factorization in which all factors are prime is called prime factorization.

**Common prime factor:** When two or more numbers have same prime factors then that factors are called common factors.

**Common multiple:** A number that is the multiple of two or more numbers is called the common multiple.

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# Web Links

www.mathworksheets4kids.com/triangles.html

www.ixl.com/math/grade-5/types-of-triangles

www.mathsisfun.com/geometry/triangles-interac_ve.html

www.bbc.co.uk/schools/teachers/ks2_ac_vi_es/maths/angles

www.icteachers.co.uk/children/sats/symmetry.htmh

www.mathplayground.com/grade_5_games.html

www.mathgames.com/grade5

www.math-play.com/5th-grade-math-games.html

https://www.chinahighlights.com/greatwall/fact/great-wall-length.htm

https://historypak.com/murree-2/

https://www.universetoday.com/15055/diameter-of-earth/

https://en.wikipedia.org/wiki/Venus

https://en.wikipedia.org/wiki/Vertebrate

https://www.caringforkids.cps.ca/handouts/healthy_sleep_for_your_b

aby_and_child

https://www.webmd.com/diet/health-benefits-boiled-eggs#1

https://en.wikipedia.org/wiki/K2

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