

Topline

GRIP On Mathematics

Book **4**

**Teacher's Resource
Manual**



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More About Numbers

Exercise: 1

1. Check whether the numbers are even or odd by division method.

(a) 68
the number is even because
the remainder of the number is 0.

$$\begin{array}{r} 2 \overline{) 68} \quad 34 \\ \underline{68} \\ 00 \end{array}$$

(c) 155
the number is odd because
the remainder of the number is 1.

$$\begin{array}{r} 2 \overline{) 155} \quad 77 \\ \underline{154} \\ 1 \end{array}$$

(h) 3437
the number is odd because
the remainder is 1.

$$\begin{array}{r} 2 \overline{) 3437} \quad 1718 \\ \underline{3436} \\ 1 \end{array}$$

2. Write whether the numbers are even or odd without actual division:

(a) 565
Number is odd
If the last digit is odd, the whole number will be the odd and the last digit is 5 which is odd.

(e) 2016
Number is even
If the last digit is even, the whole number will be the odd and the last is 6 which is even.

(k) 7651
Number is odd
If the last digit is odd, the whole number will be the odd and the last digit is 1 which is odd.

3. Write whether the sum is even or odd without actually adding:

(a) $64 + 98 = 162$
The sum of two even number is always even.

(e) $115 + 36 = 151$
The sum of an even and odd number is odd.

(d) $91 + 65 = 156$
The sum of two odd is number is always even.

4. Write the Roman numerals for:

(a) 3 => III

(d) 27 => XXVII

(i) 49 => XLIX

5. Write the Arabic numerals for:

(a) XXXV => 35

(d) XXXIX => 39

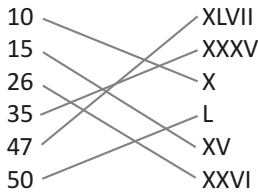
(g) L => 50

The sum of two even number is always even.

6. Complete the table:

IV	V	VI	VII	VIII	IX
XI	XII	XIII	XIV	XV	XVI
XX	XXI	XXII	XXIII	XXIV	XXV
XXIX	XXX	XXXI	XXXII	XXXIII	XXXIV
XL	XLI	XLII	XLIII	XLIV	XLV

7. Match the Arabic numbers to the Roman numbers:



Chapter 2

Addition & Subtraction

Exercise: 2.1 Revision

(a) Add the following

$$\begin{array}{r} \text{(iii)} \quad 72 \\ + 28 \\ \hline 100 \end{array}$$

$$\begin{array}{r} \text{(vi)} \quad 78 \\ + 45 \\ \hline 123 \end{array}$$

(b) Now add these

$$\begin{array}{r} \text{(iii)} \quad 426 \\ + 468 \\ \hline 894 \end{array}$$

$$\begin{array}{r} \text{(viii)} \quad 469 \\ + 333 \\ \hline 802 \end{array}$$

$$\begin{array}{r} \text{(xi)} \quad 768 \\ + 347 \\ \hline 1115 \end{array}$$

(c) Add the following

$$\begin{array}{r} \text{(ii)} \quad 5732 \\ + 3679 \\ \hline 9411 \end{array}$$

$$\begin{array}{r} \text{(viii)} \quad 4385 \\ + 2837 \\ \hline 7222 \end{array}$$

(d) Now add these

$$\begin{array}{r} \text{(ii)} \quad 39 \\ 48 \\ + 27 \\ \hline 114 \end{array}$$

$$\begin{array}{r} \text{(viii)} \quad 4710 \\ 1736 \\ + 3218 \\ \hline 9664 \end{array}$$

Exercise: 2.2

(a) Add the following

$$\begin{array}{r} \text{(i)} \quad 46,918 \\ + \quad 12,064 \\ \hline \quad 58,982 \end{array}$$

8 ones + 4 ones = 12 ones => 1 tens + 2 ones
 1 tens + 6 tens + 1 tens = 8 tens
 9 hundreds + 0 hundreds = 9 hundreds
 6 thousands + 2 thousands = 8 thousand
 4 ten thousand + 1 ten thousand = 5 ten thousand

$$\begin{array}{r} \text{(vii)} \quad 74,381 \\ + \quad 22,130 \\ \hline \quad 96,511 \end{array}$$

(b) Add the following

$$\begin{array}{r} \text{(ii)} \quad 258,725 \\ + \quad 234,983 \\ \hline \quad 493,708 \end{array}$$

5 ones + 3 ones = 8 ones
 2 tens + 8 tens = 10 tens => 1 hundred + 0 tens
 1 hundreds + 7 hundreds + 9 hundreds = 17 hundreds => 1 thousands + 7 hundreds
 8 thousands + 4 thousands + 1 thousands = 13 thousands => 1 ten thousands + 3 thousands
 5 ten thousand + 3 ten thousand + 1 ten thousands = 9 ten thousand
 2 hundred thousand + 2 hundred thousand = 4 hundred thousand

$$\begin{array}{r} \text{(xxvii)} \quad 160,540 \\ + \quad 715,939 \\ \hline \quad 876,479 \end{array}$$

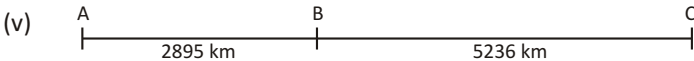
Exercise: 2.3 Word Problems

(i) A petrol pump served 59 cars in one day and 75 cars the next day. How many cars did it serve in two days?

- Petrol pump served 59 cars in one day.
- + Petrol pump served 75 cars next days.
- Petrol pump served 134 cars in two days.

(iii) A fisherman caught 155 fish in a day and caught 165 fish next day. How many fish did he catch in two days?

- A fisherman caught 155 fishes in one day.
- + A fisherman caught 165 fishes in next day.
- A fisherman caught 320 fishes in two days.



The distance between city A and city B is 2895 km and the distance between city B and city C is 5236 km. What is the distance between city A and city C?

- The distance between city A and B is 2895 km
- + The distance between city B and C is 5236 km
- The distance between city A and C is 8131 km

Exercise: 2.4 Revision

(a) Subtract

$$(i) \quad \begin{array}{r} 77 \\ - 43 \\ \hline 34 \end{array} \quad \begin{array}{l} 7 \text{ones} - 3 \text{ones} \Rightarrow 4 \text{ones} \\ 7 \text{tens} - 4 \text{tens} \Rightarrow 3 \text{tens} \end{array}$$

$$(xiii) \quad \begin{array}{r} 743 \\ - 226 \\ \hline 517 \end{array}$$

(b) Find the difference

$$(iii) \quad \begin{array}{r} 7005 \\ - 3817 \\ \hline 3188 \end{array}$$

$$(xii) \quad \begin{array}{r} 516 \\ - 49 \\ \hline 467 \end{array}$$

$$(xiv) \quad \begin{array}{r} 7185 \\ - 36 \\ \hline 7149 \end{array}$$

Exercise: 2.5

(a) Subtract the following

$$(v) \quad \begin{array}{r} 29,534 \\ - 10,211 \\ \hline 19,323 \end{array}$$

$$(vii) \quad \begin{array}{r} 25,348 \\ - 10,179 \\ \hline 15,169 \end{array}$$

(b) Subtract the following

$$(v) \quad \begin{array}{r} 513,421 \\ - 228,974 \\ \hline 284,447 \end{array}$$

$$(xvii) \quad \begin{array}{r} 594,356 \\ - 485 \\ \hline 593,871 \end{array}$$

$$(xxvii) \quad \begin{array}{r} 78,567 \\ - 4,975 \\ \hline 73,592 \end{array}$$

Exercise: 2.6 Word Problems

The population data of four cities is given in the table below.

City	Population
A	22,590
B	78,470
C	120,785
D	64,221

(1) How many more people live in 'B' than in 'A' ?

$$\begin{array}{r} \text{People live in city B} = 78,470 \\ \text{People live in city A} = 22,590 \\ \hline 55,880 \end{array}$$

55,880 more people in city B than in city A.

(2) How many more people live in 'D' than in 'A' ?

$$\begin{array}{r} \text{People live in city D} = 64,221 \\ \text{People live in city A} = 22,590 \\ \hline 41,631 \end{array}$$

41,631 more people live in city D.

(3) By how many people is the population of 'A' less than that of 'C' ?

$$\begin{array}{r} \text{People live in city C} = 120,785 \\ \text{People live in city A} = \quad - \quad \underline{22,590} \\ \hline 98,195 \end{array}$$

98,195 less people live in city A than that in city C.

(4) What is the difference in population of the cities 'B' and 'C' ?

$$\begin{array}{r} \text{People live in city C} = 120,785 \\ \text{People live in city B} = \quad - \quad \underline{78,470} \\ \hline 42,315 \end{array}$$

Difference in population of cities 'B' & 'C' = 42,315

(5) What is the difference in population of the cities 'C' and 'D' ?

$$\begin{array}{r} \text{People live in city C} = 120,785 \\ \text{People live in city D} = \quad - \quad \underline{64,221} \\ \hline 56,564 \end{array}$$

Difference in population of cities 'C' & 'D' = 56,564

Chapter 3

Multiplication & Division

Exercise: 3.2

(a) Multiply

$$\begin{array}{r} \text{(i)} \quad 75 \\ \times \quad 2 \\ \hline 150 \end{array}$$

ones = $2 \times 5 = 10$
= 1 tens + 0 Ones
Tens = $2 \times 7 = 14$
= 14 + 1 = 15

$$\begin{array}{r} \text{(v)} \quad 125 \\ \times \quad 7 \\ \hline 875 \end{array}$$

$$\begin{array}{r} \text{(xvi)} \quad 4152 \\ \times \quad 5 \\ \hline 20760 \end{array}$$

Exercise: 3.3

(a) Find the product

$$\begin{array}{r} \text{(i)} \quad 43 \quad (43 \times 1) \\ \times \quad 11 \quad (43 \times 1) \\ \hline 43 \\ + 43x \\ \hline 473 \end{array}$$

$$\begin{array}{r} \text{(x)} \quad 214 \\ \times \quad 13 \\ \hline 642 \\ + 214x \\ \hline 2782 \end{array}$$

$$\begin{array}{r} \text{(xx)} \quad 1504 \\ \times \quad 17 \\ \hline 10528 \\ + 1504x \\ \hline 25568 \end{array}$$

Exercise: 3.4

(a) Multiply:

$$\begin{array}{r} \text{(i)} \quad 70 \quad (43 \times 1) \\ \times \quad 38 \quad (43 \times 1) \\ \hline 560 \\ + 210x \\ \hline 2660 \end{array}$$

$$\begin{array}{r} \text{(x)} \quad 91 \\ \times \quad 300 \\ \hline 00 \\ 00x \\ + 273xx \\ \hline 27300 \end{array}$$

$$\begin{array}{r} \text{(xviii)} \quad 320 \\ \times \quad 800 \\ \hline 000 \\ 000x \\ + 2560xx \\ \hline 256000 \end{array}$$

Exercise: 3.5

(i) There are 12 biscuits in a certain pack. How many biscuits will be there in 12 such packs?

There are 12 biscuits in one pack
 Biscuits in $\times 12$ packs
 There will be 144 biscuits in 12 packs.

(vi) A labourer earns Rs. 700 each day. How much money does he earn in 1 week?
 (1 week = 7 days)

Labour earns in each day 700
 Days in a week $\times 7$
4900

(x) A bullock - cart can carry 75 bricks in 1 trip. How many bricks can it carry in 17 trips?

Bullock cart carry bricks in 1 trip 75
 Number of trips $\times 17$
525
 It will carry bricks in 17 trips = $+ 75 \times$
1275

Exercise: 3.6

- There are 6 groups of 3 in 18 (18 \div 3 = 6)
- There are 3 groups of 8 in 24
- There are 8 groups of 7 in 56
- There are 5 groups of 9 in 45
- There are 9 groups of 7 in 63

(b) Find the quotients and remainders

(i) $3 \overline{) 20} 6$ Quotient = 6
 $\frac{18}{2}$ Remainder = 2

(v) $7 \overline{) 45} 6$ Quotient = 6
 $\frac{42}{3}$ Remainder = 3

(ix) $4 \overline{) 27} 6$ Quotient = 6
 $\frac{24}{3}$ Remainder = 3

(c) Do the following divisions

(i) $3 \overline{) 57} 19$
 $\frac{-3}{27}$
 $\frac{-27}{00}$

(v) $7 \overline{) 245} 35$
 $\frac{-21}{35}$
 $\frac{-35}{00}$

(ix) $8 \overline{) 3968} 496$
 $\frac{-32}{76}$
 $\frac{-72}{48}$
 $\frac{-48}{00}$

(xi) $4 \overline{) 15792} 3948$
 $\frac{-12}{37}$
 $\frac{-36}{19}$
 $\frac{-16}{32}$
 $\frac{-32}{00}$

(d) Do the following divisions

$$\begin{array}{r} 5 \overline{) 57} \\ \underline{-5} \\ 7 \\ \underline{-5} \\ 2 \end{array}$$

Quotient = 11
Remainder = 2

$$\begin{array}{r} 9 \overline{) 208} \\ \underline{-18} \\ 28 \\ \underline{-27} \\ 1 \end{array}$$

Quotient = 23
Remainder = 1

$$\begin{array}{r} 6 \overline{) 41306} \\ \underline{-36} \\ 53 \\ \underline{-48} \\ 50 \\ \underline{-48} \\ 26 \\ \underline{-24} \\ 02 \end{array}$$

Quotient = 6884
Remainder = 2

Exercise: 3.7

(a) Divide

$$\begin{array}{r} 12 \overline{) 74} \\ \underline{-72} \\ 2 \end{array}$$

Quotient = 6
Remainder = 2

$$\begin{array}{r} 25 \overline{) 135} \\ \underline{-125} \\ 10 \end{array}$$

Quotient = 5
Remainder = 10

(b) Do the following divisions:

$$\begin{array}{r} 120 \overline{) 740} \\ \underline{-720} \\ 20 \end{array}$$

Quotient = 6
Remainder = 20

$$\begin{array}{r} 54 \overline{) 4567} \\ \underline{-432} \\ 247 \\ \underline{-216} \\ 31 \end{array}$$

Quotient = 84
Remainder = 31

$$\begin{array}{r} 11 \overline{) 25347} \\ \underline{-22} \\ 33 \\ \underline{-33} \\ 0047 \\ \underline{-44} \\ 3 \end{array}$$

Quotient = 2304
Remainder = 3

Exercise: 3.8

(a) Divide:

$$\begin{array}{r} 132 \overline{) 568} \\ \underline{-528} \\ 40 \end{array}$$

Quotient = 4
Remainder = 40

$$\begin{array}{r} 175 \overline{) 1050} \\ \underline{-1050} \\ 0000 \end{array}$$

Quotient = 6
Remainder = 0

(b) Divide:

$$\begin{array}{r} 115 \overline{) 24583} \\ \underline{-230} \\ 158 \\ \underline{-115} \\ 433 \\ \underline{-345} \\ 88 \end{array}$$

Quotient = 213
Remainder = 88

$$\begin{array}{r} 452 \overline{) 77392} \\ \underline{-452} \\ 3219 \\ \underline{-3164} \\ 552 \\ \underline{-452} \\ 100 \end{array}$$

Quotient = 171
Remainder = 100

Exercise: 3.9

(a) Do the following divisions:

$$\begin{array}{r} 10 \overline{) 50} \quad 5 \\ \underline{- 50} \\ 00 \end{array} \quad \begin{array}{l} \text{Quotient} = 5 \\ \text{Remainder} = 0 \end{array}$$

$$\begin{array}{r} 40 \overline{) 5166} \quad 129 \\ \underline{- 40} \downarrow \\ 116 \\ \underline{- 80} \downarrow \\ 366 \\ \underline{- 360} \\ 6 \end{array} \quad \begin{array}{l} \text{Quotient} = 129 \\ \text{Remainder} = 6 \end{array}$$

$$\begin{array}{r} 10 \overline{) 18753} \quad 1875 \\ \underline{- 180} \downarrow \\ 0075 \\ \underline{- 70} \downarrow \\ 53 \\ \underline{- 50} \\ 03 \end{array} \quad \begin{array}{l} \text{Quotient} = 1875 \\ \text{Remainder} = 3 \end{array}$$

Exercise: 3.10

(i) A teacher has to seat 102 students equally in 3 rows. How many students will be there in 1 row?

A teacher has 102 students and
There are 3 rows in which
She could divide students equally so

$$\begin{array}{r} 3 \overline{) 102} \quad 34 \\ \underline{- 9} \downarrow \\ 12 \\ \underline{- 12} \\ 00 \end{array}$$

There will 34 students in each row.

(v) The width of a rectangle is $\frac{1}{5}$ of its length. If its length is 375 ft. What is its width?

The width of rectangle is $\frac{1}{5}$ of its length

Its length is 375 ft.

so, for its width we will divide its length by 5

$$\begin{array}{r} 5 \overline{) 375} \quad 75 \\ \underline{- 35} \downarrow \\ 25 \\ \underline{- 25} \\ 00 \end{array}$$

Its width is 75 ft.

(viii) 1240 mm = _____ cm

In 1 mm there are 0.1cm

So, in 1240mm there will be

$$= 1240 \times 0.1$$

$$= 124 \text{ cm}$$

Multiples

Exercise: 4.1

(a). Write the next five multiples of each of these

- i. 4, 8, 12, 16, 20, 24, 28, 32
- v. 8, 16, 24, 32, 40, 48, 56, 64
- ix. 100, 200, 300, 400, 500, 600, 700, 800

Exercise: 4.2

(a). First write the list of multiples for each pair of numbers and then find the first three common multiples

(i). 3 and 6

The multiples of:

3 are: 3, 6, 9, 12, 15, 18

6 are: 6, 12, 18, 24, 30, 36

6, 12 and 18 are first three common factors of 3 and 6.

(xii). 5 and 20

The multiples of:

5 are: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60

20 are: 20, 40, 60, 80, 100

20, 40 and 60 are first three common factors of 5 and 20.

Exercise: 4.3

(a). Find the L.C.M of these numbers:

(i) 4 and 12

The multiples of:

4 are: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

6 are: 12, 24, 36, 48, 60

Common factors of 4 and 12 are 12, 24, 36....

L.C.M of 4 and 12 is 12.

Because 12 is the smallest factor which is divisible by 4 and 12

(x) 4, 6 and 20

The multiples of:

4 are: 4, 8, 12, 16, 20, 24, ...

6 are: 6, 12, 18, 24,

8 are: 8, 16, 24,

L.C.M of 4, 6 and 8 is 24

Factors

Exercise: 5.1

(a). Write all the factors of the following numbers:

(i) 4

Factors of 4 are: 1, 2 and 4.

(v) 13

Factors of 13 are: 1 and 13.

(x) 27

Factors of 27 are: 1, 3, 9, 27

(b). Write the missing factors:

(i) $2 \times \underline{7} = 14$

(ix) $8 \times \underline{8} = 64$

(xx) $8 \times \underline{5} = 40$

Exercise: 5.2

(a). Find the common factors of the following:

(i) 4 and 16

Factors of

4 are: ①, ② and ④

16 are: ①, ②, ④, 8 and 16

1, 2 and 4 are common factors of 4 and 16.

(v) 4 and 24

Factors of

4 are: ①, ② and ④

24 are: ①, ②, ③, ④, 6, 8, 12 and 24

1, 2 and 4 are common factors of 4 and 24

Exercise: 5.3

(a). Find the H.C.F. of the following numbers:

(i) 5 and 35

Factors of

5 are: ① and ⑤

35 are: ①, ⑤, 7 and 35

1 and 5 are common factors of 5 and 35

H.C.F. of 5 and 35 is 5

(x) 14, 42 and 63

Factors of

14 are: ①, 2, ⑦ and 14

42 are: ①, 2, 3, 6, ⑦, 14, 21 and 42

63 are: ①, 3, ⑦, 9, 21 and 63

H.C.F. of 14, 42 and 63 is 7

Chapter 6

Sequence of Mathematical Operations

Exercise: 6.1

(a). Keeping in mind the order of operations, solve these.

(i) $(18 \div 3) \div 6 + 5 - 2$

According to BODMAS rule

Step # 1 $(18 \div 3) = 6$
 $6 \div 6 + 5 - 2$

Step # 2 $6 \div 6 = 1$
 $1 + 5 - 2$

Step # 3 $1 + 5 = 6$
 $6 - 2$
 $\Rightarrow 4$ Answer

(v) $2 \times 3 - \underline{10 \div 5}$

$\underline{2 \times 3} - 2$
 $\Rightarrow 6 - 2$
 $\Rightarrow 4$ Answer

(xiv) $15 - 3 \times 3 + \underline{(36 \div 6)}$

$\Rightarrow 15 - \underline{3 \times 3} + 6$

$\Rightarrow \underline{15 - 9} + 6$
 $\Rightarrow 6 + 6$
 $\Rightarrow 12$ Answer

Chapter 7

Fractions

Exercise: 7.2

(a) Write the missing numerals

(i) $\frac{1}{3} = \frac{2}{6}$

(v) $\frac{1}{2} = \frac{5}{10}$

(d) Study the pattern first then give next three equivalent fractions

(i) $\frac{1}{4}, \frac{2}{8}, \frac{4}{16}, \frac{8}{32}, \frac{16}{64}, \frac{32}{128}$

(v) $\frac{3}{2}, \frac{6}{4}, \frac{12}{8}, \frac{24}{16}, \frac{48}{32}, \frac{96}{64}$

Exercise: 7.3

(a) Write the following fractions in lowest terms

(i) $\frac{1\cancel{8}}{24\cancel{3}} = \frac{1}{3}$

(x) $\frac{6}{24} = \frac{1}{4}$

Exercise: 7.4

(a) Which of the following are proper fractions and which are improper fractions?

(i) $\frac{1}{3} \Rightarrow$ Proper fraction
because numerator is less than denominator

(xi) $\frac{25}{20} \Rightarrow$ Improper fraction because numerator is greater than denominator

(b) Change the following mixed numbers into improper fraction

$$(i) 2\frac{3}{8} \Rightarrow 2\frac{3}{8} \xrightarrow{\text{1st step}} 16\frac{3}{8} \xrightarrow{\text{2nd step}} 16\frac{3}{8}$$

$$\Rightarrow \frac{19}{8}$$

$$(v) 3\frac{1}{10} \Rightarrow \frac{31}{10}$$

(c) Change the following into mixed numbers

$$(i) \frac{9}{2} \Rightarrow \frac{8}{2} + \frac{1}{2} \Rightarrow 4\frac{1}{2}$$

$$(x) \frac{42}{5} = \frac{40}{5} + \frac{2}{5} = 8\frac{2}{5}$$

Chapter 8

Fraction Addition and Subtraction

Exercise: 8.1

(a) Add the following like fractions and give the answers in simplest form

$$(i) \frac{3}{5} + \frac{1}{5} \Rightarrow \frac{3+1}{5} \Rightarrow \frac{4}{5}$$

$$(xv) \frac{5}{8} + \frac{2}{8} + \frac{1}{8} \Rightarrow \frac{5+2+1}{8} \Rightarrow \frac{8}{8} \Rightarrow 1$$

(c) Add the following unlike fractions and give the answers in simplest form

$$(i) \frac{1}{3} + \frac{1}{6}$$

First find equivalent fraction of both with same denominator

$$\Rightarrow \frac{1 \times 4}{3 \times 4} \Rightarrow \frac{4}{12}$$

$$\frac{1}{3} + \frac{1}{6} \Rightarrow \frac{4}{12} + \frac{2}{12} \Rightarrow \frac{4+2}{12} \Rightarrow \frac{6}{12} \Rightarrow \frac{1}{2}$$

$$(viii) \frac{1}{4} + \frac{1}{12}$$

$$\Rightarrow \frac{1 \times 6}{4 \times 6} \Rightarrow \frac{6}{24}$$

$$\Rightarrow \frac{1 \times 2}{12 \times 2} \Rightarrow \frac{2}{24}$$

$$\Rightarrow \frac{1}{4} + \frac{1}{12} \Rightarrow \frac{6}{24} + \frac{2}{24} \Rightarrow \frac{6+2}{24} \Rightarrow \frac{8}{24} \Rightarrow \frac{1}{3}$$

$$(xv) \frac{1}{5} + \frac{9}{20}$$

$$\Rightarrow \frac{1 \times 4}{5 \times 4} \Rightarrow \frac{4}{20}$$

$$\Rightarrow \frac{9 \times 1}{20 \times 1} \Rightarrow \frac{9}{20}$$

$$\Rightarrow \frac{1}{5} + \frac{9}{20} \Rightarrow \frac{4}{20} + \frac{9}{20}$$

$$\Rightarrow \frac{13}{20}$$

Exercise: 8.2

(a) Add the following mixed numbers and give the answers in simplest form

$$\begin{aligned} \text{(i)} \quad & 2\frac{1}{4} + 1\frac{3}{7} \\ & \Rightarrow (2+1) + \frac{1}{4} + \frac{3}{7} \\ & \Rightarrow (2+1) + \frac{7}{28} + \frac{12}{28} \\ & \Rightarrow (3) + \frac{7+12}{28} \\ & \Rightarrow 3 + \frac{19}{28} \\ & \Rightarrow 3\frac{19}{28} \end{aligned}$$

Since these are unlike fractions first change them into like fractions i.e same denominator.

$$\begin{aligned} \text{(vii)} \quad & 10\frac{1}{7} + 12\frac{1}{21} \\ & \Rightarrow (10+12) + \frac{1}{7} + \frac{1}{21} \\ & \Rightarrow (10+12) + \frac{3}{21} + \frac{1}{21} \\ & \Rightarrow (22) + \frac{4}{21} \\ & \Rightarrow 22\frac{4}{21} \end{aligned}$$

$$\begin{aligned} \text{(xiv)} \quad & 20\frac{7}{8} + 14\frac{1}{6} \\ & \Rightarrow (20+14) + \frac{7}{8} + \frac{1}{6} \\ & \Rightarrow (34) + \frac{21}{24} + \frac{4}{24} \\ & \Rightarrow (34) + \frac{25}{24} \\ & \Rightarrow (34) + 1\frac{1}{24} \\ & \Rightarrow 35\frac{1}{24} \end{aligned}$$

Exercise: 8.3

(a) Subtract the following like fractions and give the answers in simplest form

$$\begin{aligned} \text{(i)} \quad & \frac{7}{2} - \frac{5}{2} \\ & \Rightarrow \frac{7-5}{2} \\ & \Rightarrow \frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{2}}} \\ & \Rightarrow 1 \end{aligned}$$

$$\begin{aligned} \text{(viii)} \quad & \frac{12}{5} - \frac{2}{5} \\ & \Rightarrow \frac{12-2}{5} \\ & \Rightarrow \frac{\overset{2}{\cancel{10}}}{\underset{1}{\cancel{5}}} \\ & \Rightarrow 2 \end{aligned}$$

$$\begin{aligned} \text{(xv)} \quad & \frac{23}{35} - \frac{16}{35} \\ & \Rightarrow \frac{23-16}{35} \\ & \Rightarrow \frac{\overset{1}{\cancel{7}}}{\underset{5}{\cancel{35}}} \\ & \Rightarrow \frac{1}{5} \end{aligned}$$

(b) Subtract the following unlike fractions and give the answers in lowest terms

$$\begin{aligned} \text{(i)} \quad & \frac{3}{4} - \frac{1}{2} \\ & \Rightarrow \frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4} \end{aligned}$$

$$\therefore \Rightarrow \frac{3}{4} - \frac{2}{4} \Rightarrow \frac{3-2}{4} \Rightarrow \frac{1}{4}$$

$$\begin{aligned}
 \text{(viii)} \quad & \frac{9}{10} - \frac{3}{5} \\
 \Rightarrow & \frac{3}{5} = \frac{3 \times 2}{5 \times 2} = \frac{6}{10} \\
 \Rightarrow & \frac{9}{10} - \frac{6}{10} \\
 \Rightarrow & \frac{9-6}{10} \\
 \Rightarrow & \frac{3}{10}
 \end{aligned}$$

$$\begin{aligned}
 \text{(xv)} \quad & \frac{1}{2} - \frac{3}{16} \\
 \Rightarrow & \frac{1}{2} = \frac{1 \times 8}{2 \times 8} = \frac{8}{16} \\
 \Rightarrow & \frac{8}{16} - \frac{3}{16} \\
 \Rightarrow & \frac{8-3}{16} \Rightarrow \frac{5}{16}
 \end{aligned}$$

Exercise: 8.4

(a) Subtract the following mixed numbers and give the answers in simplest form

$$\begin{aligned}
 \text{(i)} \quad & 5 - \frac{1}{2} \\
 \Rightarrow & \overset{2 \times}{\frac{5}{1 \times 2}} - \frac{1}{2} \\
 \Rightarrow & \frac{10-1}{2} \\
 \Rightarrow & \frac{9}{2} \Rightarrow 4 \frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 \text{(viii)} \quad & 21 \frac{9}{24} - 11 \frac{1}{8} \\
 \Rightarrow & (21 - 11) + \frac{9}{24} - \frac{3}{24} \\
 \therefore & \left(\frac{1}{8} = \frac{1 \times 3}{8 \times 3} = \frac{3}{24} \right) \\
 \Rightarrow & 10 + \frac{9-3}{24} \\
 \Rightarrow & 10 + \frac{6}{24} \\
 \Rightarrow & 10 \frac{6}{24}
 \end{aligned}$$

$$\begin{aligned}
 \text{(xv)} \quad & 45 \frac{2}{3} - 15 \frac{1}{18} \\
 \Rightarrow & (45 - 15) + \frac{12}{18} - \frac{1}{18} \\
 \therefore & \left(\frac{2}{3} = \frac{2 \times 6}{3 \times 6} = \frac{12}{18} \right) \\
 \Rightarrow & 30 + \frac{11}{18} \\
 \Rightarrow & 30 \frac{11}{18}
 \end{aligned}$$

Exercise: 8.5

(1) Ali spent $\frac{1}{2}$ of his pocket money on a book and $\frac{1}{8}$ of his pocket money on eatables.

What fraction of the pocket money did he spend?

$$\begin{aligned}
 \Rightarrow & \frac{1}{2} + \frac{1}{8} \\
 \Rightarrow & \frac{4}{8} + \frac{1}{8} \\
 \Rightarrow & \frac{5}{8}
 \end{aligned}$$

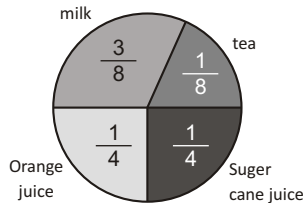
(3) Kiran bought $\frac{3}{4}$ dozen biscuit. She ate $\frac{1}{4}$ dozen. What fraction of a dozen was left?

$$\Rightarrow \frac{3}{4} - \frac{1}{4}$$

$$\Rightarrow \frac{\overset{1}{\cancel{2}}}{\cancel{4}_2}$$

$$\Rightarrow \frac{1}{2} \text{ of a dozen was left}$$

(6) The circle shows the fractions of students who like a certain drink.



(i) What fraction of students like orange juice?

$$\frac{1}{4} \text{ students like orange juice}$$

(ii) What fraction of students like milk and tea?

$$\frac{3}{8} + \frac{1}{8} = \frac{\overset{1}{\cancel{4}}}{\cancel{8}_2}$$

$$\frac{1}{2} \text{ of students like milk and tea}$$

(iii) How much greater is the fraction of students liking milk than the fraction of students liking tea?

$$\frac{3}{8} - \frac{1}{8}$$

$$= \frac{\overset{1}{\cancel{2}}}{\cancel{5}_4}$$

$$\frac{1}{4} \text{ of students like milk than the students like tea}$$

(iv) What fraction of students neither like milk nor tea?

$$\text{Orange juice} = \frac{1}{4}$$

$$\text{Sugar cane} = \frac{1}{4}$$

$$\Rightarrow \frac{1}{4} + \frac{1}{4} = \frac{\overset{1}{\cancel{2}}}{\cancel{4}_2}$$

$$\frac{1}{2} \text{ of students neither like milk nor tea}$$

Multiplication of Fractions

Exercise: 9.1

(a) Multiply the following

$$\begin{aligned} \text{(i)} \quad 18 \times \frac{1}{8} \\ \Rightarrow \frac{18 \times 1}{8} \\ \Rightarrow \frac{18}{8} \Rightarrow \frac{18}{8} \end{aligned}$$

$$\begin{aligned} \text{(vi)} \quad 4 \times \frac{3}{4} \\ \Rightarrow \frac{4 \times 3}{4} \\ \Rightarrow \frac{12}{4} \Rightarrow 3 \end{aligned}$$

$$\begin{aligned} \text{(xi)} \quad 36 \times \frac{5}{6} \\ \Rightarrow \frac{36 \times 5}{6} \\ \Rightarrow \frac{180}{6} \Rightarrow 30 \end{aligned}$$

Exercise: 9.2

(a) Complete the following

$$\begin{aligned} \text{(i)} \quad \frac{1}{3} \text{ of } 18 \\ \Rightarrow \frac{1}{3} \times 18 \\ \Rightarrow \frac{18}{3} \Rightarrow 6 \end{aligned}$$

$$\begin{aligned} \text{(v)} \quad \frac{1}{4} \text{ of } 36 \\ \Rightarrow \frac{36}{4} \\ \Rightarrow 9 \end{aligned}$$

$$\begin{aligned} \text{(ix)} \quad \frac{1}{12} \text{ of } 24 \\ \Rightarrow \frac{24}{12} \\ \Rightarrow 2 \end{aligned}$$

(b) Calculate:

$$\begin{aligned} \text{(i)} \quad \frac{3}{2} \text{ of } 20 \\ \Rightarrow \frac{3 \times 20}{2} \\ \Rightarrow \frac{60}{2} \Rightarrow 30 \end{aligned}$$

$$\begin{aligned} \text{(viii)} \quad \frac{5}{6} \text{ of } 12 \\ \Rightarrow \frac{5 \times 12}{6} \\ \Rightarrow \frac{60}{6} \Rightarrow 10 \end{aligned}$$

$$\begin{aligned} \text{(xv)} \quad \frac{7}{9} \text{ of } 36 \\ \Rightarrow \frac{7 \times 36}{9} \\ \Rightarrow \frac{252}{9} \Rightarrow 28 \end{aligned}$$

(c) Multiply:

$$\begin{aligned} \text{(i)} \quad \frac{2}{7} \times 14 \\ \Rightarrow \frac{2 \times 14}{7} \\ \Rightarrow \frac{28}{7} \\ \Rightarrow 4 \end{aligned}$$

$$\begin{aligned} \text{(vi)} \quad \frac{5}{4} \times 32 \\ \Rightarrow \frac{5 \times 32}{4} \\ \Rightarrow \frac{160}{4} \\ \Rightarrow 40 \end{aligned}$$

$$\begin{aligned} \text{(xi)} \quad \frac{7}{25} \times 50 \\ \Rightarrow \frac{7 \times 50}{25} \\ \Rightarrow \frac{350}{25} \\ \Rightarrow 14 \end{aligned}$$

Exercise: 9.3

(a) Find the value of the following:

$$(i) \frac{1}{2} \text{ of } \frac{1}{4}$$

$$\Rightarrow \frac{1 \times 1}{2 \times 4}$$

$$\Rightarrow \frac{1}{8}$$

$$(iii) \frac{1}{8} \text{ of } \frac{1}{4}$$

$$\Rightarrow \frac{1 \times 1}{8 \times 4}$$

$$\Rightarrow \frac{1}{32}$$

$$(v) \frac{1}{3} \text{ of } \frac{1}{4}$$

$$\Rightarrow \frac{1 \times 1}{3 \times 4}$$

$$\Rightarrow \frac{1}{12}$$

Exercise: 9.4

(a) Find the products:

$$(i) \frac{3}{8} \times \frac{5}{6}$$

$$\Rightarrow \frac{15}{48}$$

$$\Rightarrow \frac{5}{16}$$

$$(v) \frac{2}{3} \times \frac{9}{8}$$

$$\Rightarrow \frac{2 \times 9}{3 \times 8}$$

$$\Rightarrow \frac{18}{24} \Rightarrow \frac{3}{4}$$

$$(ix) \frac{1}{18} \times \frac{6}{7}$$

$$\Rightarrow \frac{1 \times 6}{18 \times 7}$$

$$\Rightarrow \frac{6}{126} \Rightarrow \frac{1}{21}$$

(b) Now try to find the following:

$$(i) \frac{1}{2} \text{ of } \frac{1}{4}$$

$$\Rightarrow \frac{1 \times 1}{2 \times 4}$$

$$\Rightarrow \frac{1}{8}$$

$$(v) \frac{2}{3} \text{ of } \frac{1}{3}$$

$$\Rightarrow \frac{2 \times 1}{3 \times 3}$$

$$\Rightarrow \frac{2}{9}$$

$$(viii) \frac{2}{6} \text{ of } \frac{4}{5}$$

$$\Rightarrow \frac{2 \times 4}{6 \times 5}$$

$$\Rightarrow \frac{8}{30} \Rightarrow \frac{4}{15}$$

Exercise: 9.5

(i) Kiran bought 30 cookies. She ate $\frac{1}{6}$ of them. How many cookies did she eat?

Kiran bought 30 cookies. She ate $\frac{1}{6}$ of them.

$$\therefore 30 \text{ of } \frac{1}{6}$$

$$30 \times \frac{1}{6}$$

$$\Rightarrow \frac{30}{6} \Rightarrow 5$$

She ate 5 cookies

(iv) Omar had 55 stamps. He gave $\frac{1}{5}$ of the stamps to his friend. How many stamps are left with him?

Omar had 55 stamps. He gave $\frac{1}{5}$ of stamps to his friend.

$$\therefore 55 \text{ of } \frac{1}{5}$$

$$\Rightarrow \frac{55 \times 1}{5}$$

$$\Rightarrow \frac{55}{5} \Rightarrow 11$$

$$\Rightarrow 55 - 11$$

$$\Rightarrow 44$$

44 stamps are left with him.

(vii) Mother used $\frac{1}{6}$ cup of butter to make a cake. How much butter does she require to make 3 cakes?

Mother used $\frac{1}{6}$ cup of butter to make a cake.

$$\therefore \frac{1}{6} \text{ of } 3$$

$$\Rightarrow \frac{1}{6} \times 3$$

$$\Rightarrow \frac{1 \times 3}{6}$$

$$\Rightarrow \frac{1}{2}$$

She required $\frac{1}{2}$ cup of butter to make 3 cakes

Chapter 10

Decimal Fractions

Exercise: 10.1

(a) Look at the coloured diagrams and give a decimal fraction for each

$$(1) 2\frac{3}{10}$$

$$\Rightarrow 2.3$$

$$(4) 3\frac{1}{10}$$

$$\Rightarrow 3.1$$

(b) Express the following fraction as decimals

$$(i) \frac{1}{10}$$

$$\Rightarrow 0.1$$

$$(vi) \frac{3}{10}$$

$$\Rightarrow 0.3$$

$$(xi) 19\frac{8}{10}$$

$$\Rightarrow \frac{8}{10} \Rightarrow 0.8 \Rightarrow 19.8$$

(c) Express these decimals as fractions or mixed numbers in lowest terms

(i) 0.1

$$\Rightarrow \frac{1}{10}$$

(vi) 6.4

$$\Rightarrow \frac{64}{10}$$

$$\Rightarrow 6\frac{4}{10}$$

$$\Rightarrow 6\frac{2}{5}$$

(xi) 12.9

$$\Rightarrow \frac{129}{10}$$

$$\Rightarrow 12\frac{9}{10}$$

(d) Answer these questions in terms of decimals

(1) $\frac{2}{10} = 0.2$

(2) $\frac{4}{10} = 0.4$

(3) $\frac{4}{10} = 0.4$

Exercise: 10.2

(a) Change into decimals

(i) $\frac{2}{100}$

$$\Rightarrow 0.02$$

(vi) $15\frac{10}{100}$

$$\Rightarrow 15.10$$

$$\Rightarrow 15.1$$

(xi) $8\frac{28}{100}$

$$\Rightarrow 8.28$$

(b) Write these decimals as fractions or mixed numbers in lowest terms

(i) 0.27

$$\Rightarrow \frac{27}{100}$$

(vi) 4.25

$$\Rightarrow 4\frac{25}{100}$$

$$\Rightarrow 4\frac{1}{4}$$

(xi) 6.75

$$\Rightarrow 6\frac{75}{100}$$

$$\Rightarrow 6\frac{3}{4}$$

Exercise: 10.3

(a) Write these as decimals:

(i) $\frac{3}{1000}$

$$\Rightarrow 0.003$$

(vi) $\frac{707}{1000}$

$$\Rightarrow 0.707$$

(b) Write these as fractions thousandths:

(i) 0.07

$$\Rightarrow \frac{70}{1000}$$

(vi) 0.075

$$\Rightarrow \frac{75}{1000}$$

(xi) 50.004

$$\Rightarrow 50\frac{4}{1000} \text{ or } 50004$$

Exercise: 10.4

(a) Express these fractions as decimals:

(i) $\frac{7}{5} = \frac{14}{10}$

$$\Rightarrow 1.4$$

(vi) $\frac{37}{25} \Rightarrow \frac{37 \times 4}{25 \times 4} \Rightarrow \frac{148}{100}$

$$\Rightarrow 1.48$$

(xi) $\frac{97}{50} \Rightarrow \frac{97 \times 2}{50 \times 2} \Rightarrow \frac{194}{100}$

$$\Rightarrow 1.94$$

(b) Express these mixed fractions as decimals:

$$(i) \ 3 \frac{7}{5} \quad \left\{ \begin{array}{l} \text{First make it simple fraction} \\ \text{or} \\ \text{Add the whole number to decimal} \\ \text{i.e. } \frac{14}{10} \Rightarrow 3 + 1.4 \Rightarrow 4.4 \end{array} \right\}$$
$$= \frac{22 \times 2}{5 \times 2}$$
$$\Rightarrow 4.4$$

$$(vi) \ 13 \frac{1}{40}$$
$$= \frac{1 \times 25}{40 \times 25} \Rightarrow \frac{25}{1000}$$
$$\Rightarrow 0.025$$
$$\Rightarrow 13 + 0.025$$
$$\Rightarrow 13.025$$

$$(xi) \ 8 \frac{3}{20}$$
$$= \frac{3 \times 5}{20 \times 5} \Rightarrow \frac{15}{100}$$
$$\Rightarrow 0.15$$
$$\Rightarrow 8 + 0.15$$
$$\Rightarrow 8.15$$

Exercise: 10.5

(a) Give the place value of each digit

(i) 0.008	(iii) 256.78	(v) 17.063
0 \Rightarrow Ones	2 \Rightarrow Hundreds	1 \Rightarrow Tens
.0 \Rightarrow Tenths	5 \Rightarrow Tens	7 \Rightarrow Ones
.00 \Rightarrow Hundredths	6 \Rightarrow Ones	.0 \Rightarrow Tenths
.008 \Rightarrow Thousandths	.7 \Rightarrow Tenths	.06 \Rightarrow Hundredths
	.78 \Rightarrow Hundredths	.063 \Rightarrow Thousandths

(b) Build a decimal:

(i) Five ones } two tenths } 5.2	(v) Nine thousands } eight ones } five tenths } seven hundredths } 9008.57
-------------------------------------	---

(viii) Three hundreds } two ones } seven tenths } eight hundredths } 302.78
--

(c) What does the coloured digit in each of the decimals below stand for?

(i) 137.32	(v) 724.58	(ix) 3678.224
.3 \Rightarrow Tenths	.58 \Rightarrow Hundredths	.224 \Rightarrow Thousandths

Exercise: 10.6

(a) Write the missing numbers on the number line

(i) 0.3, 0.6, 1.0, 1.6	(iii) 0.04, 0.07, 0.10, 0.13, 0.15
------------------------	------------------------------------

(b) Write “>” (greater than) or “<” (less than) in each box

- (i) $0.66 > 0.06$ (vi) $0.25 < 1.25$ (xii) $1.8 > 1.08$

(c) Give the next three numbers

- (i) 0.9, 1.0, 1.1 (iii) 6.7, 6.8, 6.9 (v) 5.17, 5.18, 5.19

(d) Write the number which is the greatest of all

- (i) 1.8 (iii) 40.5 (v) 132.2

Chapter 11

Decimals Addition and Subtraction

Exercise: 11.2

(a) Add the following decimals (regrouping wherever the sum is greater than or equal to 10)

$$\begin{array}{r} \text{(i)} \quad 2.14 \\ + 3.21 \\ \hline 5.35 \end{array} \quad \begin{array}{l} \text{Hundredths} = 4 + 1 = 5 \\ \text{Tenths} = 1 + 2 = 3 \\ \text{Ones} = 2 + 3 = 5 \end{array}$$

$$\begin{array}{r} \text{(v)} \quad 5.177 \\ + 0.233 \\ \hline 5.410 \end{array} \quad \begin{array}{l} \text{Thousandths} = 7 + 3 = 10 \Rightarrow 0 \\ \text{Hundredths} = 7 + 3 = 10 + 1 \Rightarrow 11 \Rightarrow 1 \\ \text{Tenths} = 1 + 2 = 3 + 1 \Rightarrow 4 \\ \text{Ones} = 5 + 0 = 5 \end{array}$$

$$\begin{array}{r} \text{(xi)} \quad 3.14 \\ + 2.365 \\ \hline 5.505 \end{array} \quad \begin{array}{l} \text{Thousandths} = 0 + 5 \Rightarrow 5 \\ \text{Hundredths} = 4 + 6 \Rightarrow 10 \Rightarrow 0 \\ \text{Tenths} = 1 + 3 \Rightarrow 4 + 1 \Rightarrow 5 \\ \text{Ones} = 3 + 2 \Rightarrow 5 \end{array}$$

(b) Subtract the following decimals

$$\begin{array}{r} \text{(i)} \quad 0.85 \\ - 0.21 \\ \hline 0.64 \end{array} \quad \begin{array}{l} \text{Hundredths} = 5 - 1 \Rightarrow 4 \\ \text{Tenths} = 8 - 2 \Rightarrow 6 \\ \text{Ones} = 0 - 0 \Rightarrow 0 \end{array}$$

$$\begin{array}{r} \text{(v)} \quad 5.346 \\ - 2.973 \\ \hline 2.373 \end{array} \quad \begin{array}{l} \text{Thousandths} = 6 - 3 \Rightarrow 3 \\ \text{Hundredths} = 14 - 7 \Rightarrow 7 \\ \text{Tenths} = 12 - 9 \Rightarrow 3 \\ \text{Ones} = 4 - 2 \Rightarrow 2 \end{array}$$

$$\begin{array}{r} \text{(ix)} \quad 15.320 \\ - 7.544 \\ \hline 7.776 \end{array} \quad \begin{array}{l} \text{Thousandths} = 10 - 4 \Rightarrow 6 \\ \text{Hundredths} = 11 - 4 \Rightarrow 7 \\ \text{Tenths} = 12 - 5 \Rightarrow 7 \\ \text{Ones} = 14 - 7 \Rightarrow 7 \\ \text{Tens} = 0 - 0 \Rightarrow 0 \end{array}$$

Exercise: 11.3

(i) In a race, Ali ran to the finish point in 10.5 seconds and took another 9.8 seconds to run back to original position. How long did it take him to run back to his start point?

Ali ran to finish point in 10.5 seconds took another 9.8 seconds to run back

$$\begin{array}{r} 10.5 \\ + 9.8 \\ \hline 20.3 \end{array}$$

It takes 20.3 seconds to run back to his start point.

(iii) Kiran's height is 4.65 feet whereas Sana has a height of 4.7 feet. What is the difference in their heights?

Kirans height is 4.65 feet
Sana has a height 4.7 feet

$$\begin{array}{r} 4.70 \\ + 4.65 \\ \hline 0.05 \end{array}$$

Difference in their heights is 0.05

(v) The weight of an empty dish is 2.5 kg. What is the weight of the dish if 4.5 kg of meat is put in it?

Weight of an empty dish is 2.5 kg
Adding meat of 4.5 kg

$$\begin{array}{r} 2.5 \\ + 4.5 \\ \hline 7.0 \end{array}$$

The weight of dish will be 7 kg

Chapter 12

Decimals Multiplication and Division

Exercise: 12.1

(a) Multiply by 10

$$\begin{array}{r} \text{(i)} \quad 3.4 \\ \times 10 \\ \hline 34.0 \end{array}$$

$$\begin{array}{r} \text{(vi)} \quad 264.39 \\ \times 10 \\ \hline 2643.9 \end{array}$$

$$\begin{array}{r} \text{(xi)} \quad 184.67 \\ \times 10 \\ \hline 1846.7 \end{array}$$

Move decimal 1 digit to the right, if no digit add zero

(b) Multiply by 100

$$\begin{array}{r} \text{(i)} \quad 0.14 \\ \times 100 \\ \hline 14.0 \end{array}$$

$$\begin{array}{r} \text{(vi)} \quad 540.169 \\ \times 100 \\ \hline 54016.9 \end{array}$$

$$\begin{array}{r} \text{(xi)} \quad 19.32 \\ \times 100 \\ \hline 1932.0 \end{array}$$

Move decimal 2 digit to the right, if no digit add zero

Exercise: 12.2

(a) Find the product

$$\begin{array}{r} \text{(i)} \quad 0.9 \\ \times \quad 3 \\ \hline 2.7 \end{array}$$

$$\begin{array}{r} \text{(v)} \quad 42.5 \\ \times \quad 6 \\ \hline 255.0 \end{array}$$

$$\begin{array}{r} \text{(vii)} \quad 5.87 \\ \times \quad 7 \\ \hline 41.09 \end{array}$$

Exercise: 12.3

(a) Multiply these:

$$\text{(i)} \quad 0.5 \times 13$$

$$\begin{array}{r} 0.5 \\ \times 13 \\ \hline 6.5 \end{array}$$

$$\text{(vi)} \quad 54.9 \times 15$$

$$\begin{array}{r} 54.9 \\ \times 15 \\ \hline 823.5 \end{array}$$

$$\text{(ix)} \quad 7.2 \times 22$$

$$\begin{array}{r} 7.2 \\ \times 22 \\ \hline 158.4 \end{array}$$

Exercise: 12.4

(a) Divide the following numbers by 10

$$\text{(i)} \quad 3.1 \div 10$$

$$\begin{array}{r} 0.31 \\ \hline \end{array} \quad \text{Shift the decimal 1 place to the left}$$

$$\text{(viii)} \quad 76.36 \div 10$$

$$\begin{array}{r} 7.636 \\ \hline \end{array}$$

$$\text{(xv)} \quad 223.7 \div 10$$

$$\begin{array}{r} 22.37 \\ \hline \end{array}$$

(b) Divide the following numbers by 100

$$\text{(i)} \quad 52.5 \div 100$$

$$\begin{array}{r} 0.525 \\ \hline \end{array} \quad \text{Shift the decimal 2 place to the left}$$

$$\text{(viii)} \quad 92.1 \div 100$$

$$\begin{array}{r} 0.921 \\ \hline \end{array}$$

$$\text{(xv)} \quad 2.92 \div 100$$

$$\begin{array}{r} 0.0292 \\ \hline \end{array}$$

Exercise: 12.5

(a) Divide the following decimals:

$$\text{(i)} \quad 0.75 \div 3$$

$$\begin{array}{r} 3 \overline{) 0.75} \quad 0.25 \\ \underline{-0} \downarrow \\ 07 \downarrow \\ \underline{-06} \downarrow \\ 15 \\ \underline{-15} \\ 00 \end{array}$$

$$0.75 \div 3 = 0.25$$

$$\text{(viii)} \quad 125.8 \div 2$$

$$\begin{array}{r} 2 \overline{) 125.8} \quad 62.9 \\ \underline{-12} \downarrow \\ 05 \downarrow \\ \underline{-4} \downarrow \\ 18 \\ \underline{-18} \\ 00 \end{array}$$

$$125.8 \div 2 = 62.9$$

$$\text{(xv)} \quad 5.74 \div 4$$

$$\begin{array}{r} 4 \overline{) 5.74} \quad 1.435 \\ \underline{-4} \downarrow \\ 17 \downarrow \\ \underline{-16} \downarrow \\ 14 \\ \underline{-12} \\ 20 \\ \underline{-20} \\ 00 \end{array}$$

$$5.74 \div 4 = 1.435$$

Exercise: 12.6

(a) Divide the following decimals:

(i) $22.65 \div 15$

$$\begin{array}{r} 15 \overline{) 22.65} \quad 1.51 \\ \underline{-15 \downarrow} \\ 76 \\ \underline{-75 \downarrow} \\ 15 \\ \underline{-15} \\ \underline{00} \end{array}$$

$$22.65 \div 15 = 1.51$$

(viii) $37.8 \div 21$

$$\begin{array}{r} 21 \overline{) 37.8} \quad 1.8 \\ \underline{-21 \downarrow} \\ 168 \\ \underline{-168} \\ 0 \end{array}$$

$$37.8 \div 21 = 1.8$$

(xv) $97.44 \div 12$

$$\begin{array}{r} 12 \overline{) 97.44} \quad 8.12 \\ \underline{-96 \downarrow} \\ 14 \\ \underline{-12 \downarrow} \\ 24 \\ \underline{-24} \\ \underline{00} \end{array}$$

$$97.44 \div 12 = 8.12$$

Exercise: 12.7

(i) You know that 1 meter = 100 centimeters. How many centimeters are 12.59 meters?

1 meter = 100 centimeters

12.59 meters = ? centimeters

So, from greater value to smaller value, we will multiply.

$$\begin{array}{r} 12.59 \\ \times \quad 100 \\ \hline 1259.0 \end{array}$$

12.59 meters = 1259 centimeter

(v) A labour worked for 5 hours and earned 125.5 rupees. How much did he earn per hour?

Labour worked for 5 hours

Salary he earned is 125.5 Rs.

$$\begin{array}{r} 5 \overline{) 125.5} \quad 25.1 \\ \underline{-10 \downarrow} \\ 25 \\ \underline{-25 \downarrow} \\ 05 \\ \underline{-05} \\ \underline{00} \end{array}$$

He earned 25.1 rs per hour

(viii) A notebook costs 9.5 rupees. What will be the cost of 25 such books?

Notebook costs 9.5 rupees cost

of 25 books will be

$$\begin{array}{r} 25 \\ \times \quad 9.5 \\ \hline 237.5 \end{array}$$

25 such books will cost 237.5

Average

Exercise: 13.1

(a) Find the average of these numbers

(i) 5, 7 and 12

$$\begin{aligned} \text{Average} &= \frac{\text{Sum of quantities}}{\text{Number of quantities}} \\ &= \frac{5 + 7 + 12}{3} \\ &= \frac{24}{3} \\ &= 8 \end{aligned}$$

Average of 5, 7 and 12 is 8

(iv) 12, 16 and 18

$$\begin{aligned} \text{Average} &= \frac{12 + 16 + 18}{3} \\ &= \frac{46}{3} \\ &= 15.33 \end{aligned}$$

Average of 12, 16 and 18 is 15.33

(vii) 3, 5, 5, 7 and 10

$$\begin{aligned} \text{Average} &= \frac{3 + 5 + 5 + 7 + 10}{5} \Rightarrow \frac{30}{5} \\ &= 6 \end{aligned}$$

Average of 3, 5, 5, 7 and 10 is 6

Exercise: 13.3

(i) The number of ball in three bags is 5, 6 and 7 respectively. What is the average number of balls in each bag?

Number of balls in three boys is 5, 6 and 7 average numbers of balls in each boy should

$$\begin{aligned} \text{Average} &= \frac{5 + 6 + 7}{3} = \frac{15}{3} \\ &= 6 \end{aligned}$$

Average of ball in each boy is 6

(v) Ali saved Rs. 30 in June, Rs. 35 in July and Rs. 40 in August

Average of saving per month should be

$$\begin{aligned} \text{Average} &= \frac{30 + 35 + 40}{3} = \frac{105}{3} \\ &= 35 \end{aligned}$$

Average of saving per month is 35

(x) A book consists of 150 pages and another has 186 pages. What is the average number of pages per book?

A book consists of 150 pages, another has 186 pages
Average number of pages should be

$$\begin{aligned} \text{Average} &= \frac{150 + 186}{2} = \frac{336}{2} \\ &= 168 \end{aligned}$$

Average number of pages per book is 168

Chapter 14

Squares and Square Roots

Exercise: 14.1

(a) Now find the squares of the following numbers:

(i) 3

$$\begin{aligned} \Rightarrow 3^2 &= 3 \times 3 \\ \Rightarrow 9 \end{aligned}$$

(vi) 9

$$\begin{aligned} \Rightarrow 9^2 &= 9 \times 9 \\ \Rightarrow 81 \end{aligned}$$

(xi) 15

$$\begin{aligned} \Rightarrow 15^2 &= 15 \times 15 \\ \Rightarrow 225 \end{aligned}$$

(b) Find the square root of:

(i) 25

$$\begin{aligned} \Rightarrow \sqrt{25} \\ \Rightarrow \sqrt{5 \times 5} \\ \Rightarrow 5 \end{aligned}$$

(iii) 64

$$\begin{aligned} \Rightarrow \sqrt{64} \\ \Rightarrow \sqrt{8 \times 8} \\ \Rightarrow 8 \end{aligned}$$

(v) 49

$$\begin{aligned} \Rightarrow \sqrt{49} \\ \Rightarrow \sqrt{7 \times 7} \\ \Rightarrow 7 \end{aligned}$$

(c) Do the following numbers have perfect square roots. Say yes or no.

You can check by making squares.

(i) No

(ii) Yes

(iii) No

(iv) Yes

(v) No

(vi) No

Chapter 15

Sequence and Series

Exercise: 15.2

(a) Operations '+ 4'

(i) 3, 7..... 23

3, 7, 11, 15, 19, 23

(iii) 4, 8..... 32

4, 8, 12, 16, 20, 24, 28, 32

(v) 1, 5..... 21

1, 5, 9, 13, 17, 21

(b) Operations '- 3'

(i) 35, 32..... 11

35, 32, 29, 26, 23, 20, 17, 14, 11

(iii) 41, 38..... 26

41, 38, 35, 32, 29, 26

(v) 33, 30..... 15

33, 30, 27, 24, 21, 18, 15

Exercise: 15.3

Discover the hidden operations in these chains and continue them to their 10th number.

(i) 4, 7, 10, 13, 16,

19, 22, 25, 28, 31

(iv) 2, 4, 8, 16, 32,

64, 128, 256, 512, 1024

Exercise: 15.4

(i) Where does this chain end?

= 1

(ii) What is the missing number?

= 4

(iii) Try lots of other starting numbers. Where do their chains end?

= Students do it by themselves.

Chapter 16

Time

Exercise: 16.1

(a) Change the hours into seconds

(i) 2 hours

=> 1hr = 3600 seconds

2hr = 3600 x 2 = 7200 seconds

(iii) 5 hours

=> 1hr = 3600 seconds

5hr = 3600 x 5 = 18000 seconds

(vi) 2 hr 30 mins

$$\Rightarrow 1\text{min} = 60\text{ sec}$$

$$30\text{mins} = 60 \times 30 \\ = 1800\text{ sec}$$

$$1\text{hr} = 3600\text{ secs}$$

$$2\text{hr} = 3600 \times 2 \\ = 7200\text{ sec}$$

$$2\text{hr } 30\text{ mins} = 7200\text{ secs} + 1800\text{ secs}$$

$$2\text{hr } 30\text{mins} = 9000\text{ secs}$$

(b) Change the minutes into seconds

(i) 2 minutes

$$\Rightarrow 1\text{ minutes} = 60\text{ seconds}$$

$$2\text{ minutes} = 60 \times 2 \\ = 120\text{ seconds}$$

(iii) 4 minutes

$$\Rightarrow 1\text{ minutes} = 60\text{ seconds}$$

$$4\text{ minutes} = 60 \times 4 \\ = 240\text{ seconds}$$

(vi) 10 minutes

$$\Rightarrow 1\text{ minutes} = 60\text{ seconds}$$

$$10\text{ minutes} = 60 \times 10 \\ = 600\text{ seconds}$$

(c) First change the hours or minutes into seconds and tell which is greater

(i) 2 hours or 8400 secs

$$1\text{ hour} = 3600\text{ seconds}$$

$$2\text{ hour} = 3600 \times 2 \\ = 7200\text{ seconds}$$

7200 secs or 8400 secs

8400 secs is greater

(iii) 3 hours or 14000 seconds

$$1\text{ hour} = 3600\text{ secs}$$

$$3\text{ hours} = 3600 \times 3\text{ secs} \\ = 10800\text{ seconds}$$

10800 secs or 14000 secs

14000 secs is greater

(v) 45 minutes or 5400 seconds

$$1\text{ minutes} = 60\text{ second}$$

$$45\text{ minutes} = 60 \times 45 \\ = 2700\text{ seconds}$$

2700 seconds or 5400 seconds

5400 seconds is greater

Exercise: 16.2

(a) Write the following times using a.m or p.m

(i) 25 minutes past 7 in the morning

$$= 7 : 25\text{ A.m}$$

(v) A quarter to 1 in the afternoon

$$= 12 : 45\text{ P.m}$$

(viii) Half past 11 at night

$$= 11 : 30\text{ P.m}$$

Exercise: 16.3

(a) What times in the morning do the following clocks show

(ii)



Half past 2

(iv)



3 O'clock

(v)



Quarter to 6

(b) What times do the following clocks show? (in the evening or at night)

(ii)



12 O'clock
in the evening

(iv)



Quarter to 8

(vi)



10 minutes to 11

(c) Show the following times by drawing clock faces

Students do it by themselves.

Exercise: 16.4

(a) Find the difference in minutes

(i) 7:30 to 7:55

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 7 \quad 30 \\ - 7 \quad 30 \\ \hline 0 \quad 25 \end{array}$$

25 minutes

(v) 8:15 to 8:30

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 8 \quad 15 \\ - 8 \quad 15 \\ \hline 0 \quad 15 \end{array}$$

15 minutes

(viii) 1:10 to 1:50

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 1 \quad 50 \\ - 1 \quad 10 \\ \hline 0 \quad 40 \end{array}$$

40 minutes

(b) Find the time difference

(i) 15 20 hours to 16 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 16 \quad 00 \\ - 15 \quad 20 \\ \hline 00 \quad 40 \end{array}$$

40 minutes

(iii) 23 10 hours to 23 45 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 23 \quad 45 \\ - 23 \quad 10 \\ \hline 00 \quad 35 \end{array}$$

35 minutes

(vi) 21 00 hours to 21 25 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 21 \quad 25 \\ - 21 \quad 00 \\ \hline 00 \quad 25 \end{array}$$

25 minutes

(c) Find the difference in hours and minutes from

(i) 15 20 hours to 19 00 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 18 \quad \underline{19} \quad \underline{00} \quad 60 \\ - \quad 15 \quad 20 \\ \hline \quad 3 \quad 40 \end{array}$$

3 hours 40 minutes

(vi) 06 45 hours to 12:00 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 11 \quad \underline{12} \quad \underline{00} \quad 60 \\ - \quad 06 \quad 45 \\ \hline \quad 05 \quad 15 \end{array}$$

5 hours 15 minutes

(ix) 05 20 hours to 07 45 hours

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 07 \quad 45 \\ - \quad 05 \quad 20 \\ \hline \quad 02 \quad 25 \end{array}$$

2 hours 25 minutes

Exercise: 16.5

(i) Ali took 1 hour 45 minutes to reach his aunt's house and 1 hour 40 minutes to come back. How much time did he take for the total trip?

Ali took 1 hour 45 mins to reach his aunt's house.

And took 1 hour 40 mins to come back.

Total time of trip will be.

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 1 \quad 45 \\ + \quad 1 \quad 40 \\ \hline 2 \quad 85 \end{array}$$

2 hours 85 minutes

$$\begin{array}{r} \text{mins} \\ 85 \\ \underline{60} \\ 25 \end{array}$$

= 3 hours 25 minutes

Total time of trip is 3 hours 25 minutes

(v) A clock is 45 minutes slow. It is showing 3:35 now. What should be the correct time?

Clock is 45 minutes slow. It is showing 3:35 now.

Correct time is

$$\begin{array}{r} \text{hours} \quad \text{mins} \\ 3 \quad 35 \\ + \quad 0 \quad 45 \\ \hline 3 \quad 80 \end{array}$$

$$\begin{array}{r} \text{mins} \\ 80 \\ - \quad 60 \\ \hline 20 \end{array}$$

= 4 hours 20 minutes

i.e 4:20 is the correct time

(x) A clock is 25 minutes fast. It is showing 6:25 now. What should be the correct time?

Clock is 25 minutes fast it is showing 6:25 correct time is

	hours	mins
	6	25
-	0	25
	6	00

Correct time is 6:00

Chapter 17

Angles and Directions

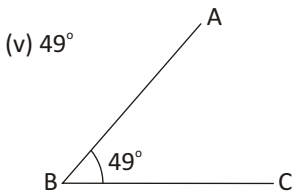
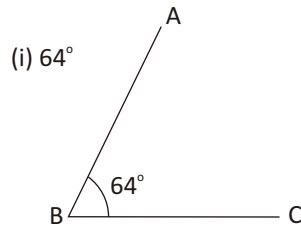
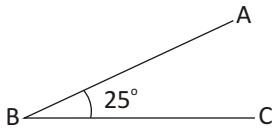
Exercise: 17.2

(a) Measure each angle with a protractor

- (i) 136° (ii) 40° (iii) 135° (iv) 90°

(b) Draw the angles which measure:

- (i) 25°



Exercise: 17.2

(c) This is a triangle $\triangle ABC$ with three angles. $\angle A$, $\angle B$ and $\angle C$

- (i) $\angle A = 65^\circ$ $\angle B = 90^\circ$ $\angle C = 25^\circ$
 (ii) $\angle A + \angle B + \angle C = 180^\circ$

Exercise: 17.3

(a) Measure the angles of this triangle with a protractor and answer the following questions:

- (i) 65° (ii) 90° (iii) 25° (iv) 2
 (v) 5 (vi) 0 (vii) 180°

(b) Measure the following angles and tell whether they are acute, right or obtuse.

- (i) Acute (ii) Obtuse (iii) Obtuse (Below 90° is acute
(iv) Acute (v) Obtuse (vi) Acute Above 90° is obtuse)

(c) Find the following angles:

- (i) All are 90° (ii) 360° (iii) 4

Exercise: 17.4

(a) Tell the direction which you will face if you turn in clockwise rotation of

- (i) North - East (iii) South (v) West - North

(b) Tell the direction which you will face if you turn in anti clockwise rotation of

- (i) North - West (iii) South - East (v) South - West

Exercise: 17.5

- (i) South
(v) North
(x) West

Chapter 18

Basics of Geometry

Exercise: 18.2

Find the perimeters of these triangles:

- (i) Perimeter = $5 + 3 + 4$ (iii) Perimeter = $4.5 + 4.5 + 4.5$
= 12 cm = 13.5 cm

- (v) Perimeter = $3.5 + 5 + 5$
= 13.5 cm

Exercise: 18.3

Find the perimeter of the following rectangles using the above formula:

- (i) Perimeter = $2(L + B)$
= $2(4 + 2.5)$
= $2(6.5)$
= 13 cm

Perimeter of rectangle = $L + B + L + B$ = $2L + 2B$ = $2(L + B)$

- (iii) Perimeter = $2(L + B)$
= $2(6 + 8)$
= $2(14)$
= 28 cm

- (v) Perimeter = $2(L + B)$
= $2(4 + 7)$
= $2(11)$
= 22 cm

Exercise: 18.4

Using the formula find the perimeters of the square having following sides:

$$\begin{aligned} \text{(i) Perimeter} &= 4 \times (8) \\ &= 32 \text{ cm} \end{aligned}$$

Perimeter of square = 4 x length of a side
--

$$\begin{aligned} \text{(vi) Perimeter} &= 4 \times 20 \\ &= 80 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(xi) Perimeter} &= 4 \times 30 \\ &= 120 \text{ cm} \end{aligned}$$

Exercise: 18.5

Find the perimeters of the following figures:

Other than triangle, rectangle or square, The perimeter of each figure is the sum of lengths of its sides.

$$\begin{aligned} \text{(i) Perimeter} &= 1 + 1 + 4 + 4 + 4 + 5 + 5 + 8 \\ &= 32 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(iii) Perimeter} &= 1 + 1 + 1 + 2 + 2 + 8 \\ &= 15 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{(vi) Perimeter} &= 2.5 + 2.5 + 1 + 1 + 4 + 4 + 7 + 7 + 1 \\ &= 30 \text{ cm} \end{aligned}$$

Exercise: 18.6

(i) A rectangular field measures 40 km into 30 km. Find out the perimeter of the field.

A rectangular field measures 40km into 30km as the perimeter of rectangle is

$$\begin{aligned} \text{Measured by} &= 2(L + B) \\ &= 2(40 + 30) \\ &= 2(70) \\ &= 140 \text{ cm} \end{aligned}$$

The perimeter of the field is 140 cm

(v) A square table-cloth has a perimeter of 1600 cm. What is the length of a side of a table-cloth? field.

A square table cloth has a perimeter of 1600cm

The perimeter of square is the sum of all 4 sides so the side can be measured by dividing its perimeter by 4.

$$\text{Sides} = \frac{1600}{4} \text{ cm}$$

$$\text{Sides} = 400 \text{ cm}$$

Length of side of table cloth is 400cm

(viii) A triangle has 3 equal sides of length, 14 cm each. What is its perimeter?

A triangle has 3 equal sides each side = 14cm

$$\begin{aligned}\text{Perimeter} &= 14 + 14 + 14 \\ &= 42 \text{ cm}\end{aligned}$$

The perimeter of the triangle is 42cm

Exercise: 18.8

(a) Find the areas of the following rectangles:

$$\text{Area of rectangle} = \text{length} \times \text{breadth}$$

$$\begin{aligned}\text{(i) Area} &= 10 \times 2 \\ &= 20 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(iii) Area} &= 8 \times 4 \\ &= 32 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(v) Area} &= 6 \times 8 \\ &= 48 \text{ cm}^2\end{aligned}$$

Exercise: 18.9

Using the formula, find the areas of the following squares:

$$\text{Area of square} = \text{side} \times \text{side}$$

$$\begin{aligned}\text{(i) Area} &= 5 \times 5 \\ &= 25 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(iii) Area} &= 7 \times 7 \\ &= 49 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{(v) Area} &= 3 \times 3 \\ &= 9 \text{ cm}^2\end{aligned}$$

Exercise: 18.10

(i) A rectangular piece of carpet is 6 m long and 4 m wide. What is its area?

A rectangular piece of carpet is 6 m long and 4 m wide.

$$\begin{aligned}\text{Area of rectangle} &= \text{length} \times \text{breadth} \\ &= 6 \times 4 \\ &= 24 \text{ cm}^2\end{aligned}$$

(iii) The top of a square box has a side of 12 cm. What is its area?

The top of a square box has a side of 12 cm.

$$\begin{aligned}\text{Area of square} &= \text{side} \times \text{side} \\ &= 12 \times 12 \\ &= 144 \text{ cm}^2\end{aligned}$$

(v) Look at the figure and complete this table.

Face	Length	Breadth	Area = length x breadth
1	3 cm	2 cm	$3 \times 2 = 6 \text{ cm}^2$
2	2 cm	6 cm	$2 \times 6 = 12 \text{ cm}^2$
3	3 cm	6 cm	$3 \times 6 = 18 \text{ cm}^2$

Exercise: 18.11

Choose from the following:

- (i) Line (ii) Intersecting lines (iii) Ray (iv) Line segment
(v) Ray (vi) Line (vii) Intersecting lines (viii) Line segment

Exercise: 18.12

(a) Which of the following pairs of lines are parallel?

- (i) Not parallel (ii) Parallel (iii) Not parallel (iv) Parallel
(v) Not parallel (vi) Parallel

Note: Lines which do not meet at any point when they are produced in either direction is called parallel lines.

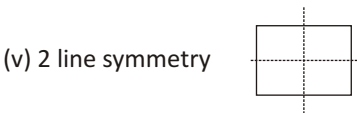
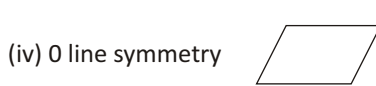
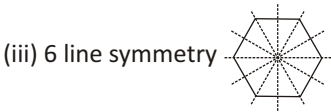
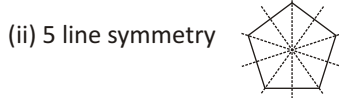
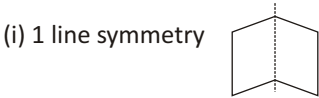
(b) Which of the following pairs of lines are perpendicular?

- (i) Perpendicular (ii) Perpendicular (iii) Not perpendicular
(iv) Not perpendicular (v) Not perpendicular (vi) Perpendicular

Note: Lines which make an angle of 90° is called perpendicular lines.

Exercise: 18.13

How many lines of symmetry do these figures have? Also draw the line of symmetry.



Note: Line which can fold the figure into two equal parts is called line of symmetry.

Exercise: 18.14

(a) Write the name for each shape

- (i) Pentagonal pyramid (ii) Triangular pyramid
(iii) Hexagonal prism (iv) Pentagonal prism
(v) Square based pyramid (vi) Triangular prism

(b) Write the name of the shape described in each of the questions

- (i) 1 square based pyramid (ii) Triangular pyramid
(iii) Triangular prism (iv) cube

Shapes

Exercise: 19.1

(a) Write the name of each triangle. Some triangles may have more than one name.

- (i) Isosceles (ii) Scalene (iii) Isosceles (iv) Right Angle Triangle
(v) Equilateral Triangle (vi) Equilateral Triangle

Exercise: 19.2

(a) Name each of these quadrilaterals. Use a ruler to help you.

- (i) Rhombus (ii) Kite (iii) Parallelogram (iv) Trapezium
(v) Square (vi) Rectangle

Exercise: 19.3

(a) How many sides do each of these polygons have? Name them.

- (i) Quadrilateral (ii) Hexagon (iii) Octagon (iv) Pentagon
(v) Triangle (vi) Heptagon