

Composite Mathematics-6

1. Knowing Our Numbers

Exercise 1A-1B

Do yourself.

Exercise 1C

- Quantity of steel used by Mr. Sanjay = 3715 kg 400 g
Quantity of steel used by Mr. Rajesh = 4825 kg 250 g
Total quantity of steel used by both
$$= 3715 \text{ kg } 400 \text{ g} + 4825 \text{ kg } 250 \text{ g}$$
$$= \mathbf{8540 \text{ kg } 650 \text{ g}} \text{ or } \mathbf{8540650 \text{ g}}$$
Thus, total quantity of steel used by both is 8540 kg 650 g or 8540650 g.
- Difference of steel used by both = 4825 kg 250 g – 3715 kg 400 g
$$= \mathbf{1109 \text{ kg } 850 \text{ g}}$$
Thus, difference of steel is 1109 kg 850 g.
- Quantity of wheat carried by cart = 1745 kg 700 g
Number of carts = 15
Quantity of wheat carried by 15 such carts
$$= (1745 \text{ kg } 700 \text{ g}) \times 15 = \mathbf{26185 \text{ kg } 500 \text{ g}}$$
or
$$= \mathbf{26185500 \text{ g}}$$
Thus, 26185 kg 500 g or 26185500 g wheat will be carried by such 15 carts.
- Perimeter of a field = 750 m 80 cm
Perimeter of a park = 378 m 70 cm
Length of both the perimeter = 750 m 80 cm + 378 m 70 cm
$$= \mathbf{1129 \text{ m } 50 \text{ cm}} \text{ or } \mathbf{112950 \text{ cm}}$$
Thus, 1129 m 50 cm or 112950 cm is the total length of both perimeter.
- Total length of ribbon Sita had = 254 m 25 cm
Number of friends in which ribbon is to be divided = 15
Length of ribbon that each one will get = (254 m 25 cm) ÷ 15
$$= \mathbf{16 \text{ m } 95 \text{ cm}} \text{ or } \mathbf{1695 \text{ cm}}$$
Thus, the length of ribbon that each one will get is 16 m 95 cm.
And in cm = 1695 cm
- The perimeter of park = 475 m 50 cm or 47550 cm
Distance will cover in 5 rounds = 47550 cm × 5
$$= \mathbf{237750 \text{ cm}} \text{ or } \mathbf{2377 \text{ m } 50 \text{ cm}}$$
Thus, man walks 237750 cm or 2377 m 50 cm.

7. Total amount of sugar with shopkeeper = 65 kg 520 g
 Number of customer in which it is to be divided = 9
 Amount of sugar that each customer will get = $(65 \text{ kg } 520 \text{ g}) \div 9$
 = **7 kg 280 g or 7280 g**
 Thus, amount of sugar given to each customer by the shopkeeper is 7 kg 280 g.
 And in g = 7280 g
8. Consumption of diesel in Machine A = 3200 L 208 mL
 Consumption of diesel in Machine B = 2486 L 196 mL
 Difference of consumption
 = 3200 L 208 mL – 2486 L 196 mL
 = **714 L 12 mL**
 Thus, consumption of diesel of Machine B is 714 L 12 mL less than Machine A.
9. Quantity of water in the tank = 47865 L 360 mL
 Quantity of consumed water = 23912 L 125 mL
 Quantity of left water = 47865 L 360 mL – 23912 L 125 mL
 = **23953 L 235 mL**
 Thus, 23953 L 235 mL water left in the tank.

Exercise 1D

1. to 4.: Do yourself.
5. Cost of LED television = ₹ 29980
 Cost of microwave = ₹ 17699
 Total amount = ₹ 47679
 Estimated amount nearest to hundreds = ₹ **47700**
 Difference between both amount = ₹ 47700 – ₹ 47679 = ₹ 21
 Thus, estimated amount nearest to hundreds is ₹ 47700 and **estimated amount is ₹ 21 more than total amount.**
6. Quantity of wheat shopkeeper has = 3896 kg
 Estimated quantity of wheat shopkeeper has = 4000 kg
 Quantity of wheat sells everyday = 152 kg
 Estimated quantity of wheat sells everyday = 150 kg
 Quantity of wheat sold in 20 days = $150 \times 20 = 3000 \text{ kg}$
 Quantity of wheat left after 20 days = $4000 \text{ kg} - 3000 \text{ kg} = \mathbf{1000 \text{ kg}}$
 Thus, estimated quantity of wheat is 1000 kg left after 20 days.
7. Number of bags of sugar in godown = 5789672
 Number of bags of pulses in godown = 6739572
 Sum of the bags in godown = $5789672 + 6739572$
 = 12529244 bags
 Estimated sum of the bags nearest to the thousands = 12530000

Exercise 1E

Do yourself.

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 6. Do yourself.

7. Stock of wheat bags = 35967840

Stock of rice bags = 28535960

Stock of bajra bags = 18368540

Total number of bags in godown

$$= 35967840 + 28535960 + 18368540$$

$$= \mathbf{82872340}$$

8. Amount of money Mohit has = ₹ 5385980

Cost of house = ₹ 3876560

Cost of car = ₹ 539849

Total money he spent = ₹ 3876560 + ₹ 539849

$$= ₹ 4416409$$

Amount of money left with him = ₹ 5385980 – ₹ 4416409

$$= ₹ \mathbf{969571}$$

Thus, ₹ 969571 is left with him.

9. Weight of each box = 25 kg 500 g = 25.500 kg

Carrying capacity of truck = 6018 kg

Number of boxes can be loaded in truck

$$= \frac{\text{Carrying capacity of truck}}{\text{Weight of one box}}$$

$$= \frac{6018}{25.500} = \mathbf{236 \text{ box}}$$

Thus, truck can carry 236 boxes.

10. Production of screws in one day = 4826

Number of Holidays in 2020 year = 65

Number of working days = 366 – 65 (∵ 2020 is leap year)

$$= 301 \text{ days}$$

Production of screws in 301 days = 4826 × 301

$$= \mathbf{1452626 \text{ screws}}$$

Thus, 1452626 screws will produce in year 2020.

11. Do yourself.

12. Do yourself.

2. Natural and Whole Numbers

Exercise 2A

1. Do yourself.
2. (i) $300507 + 0 = \mathbf{300507}$
(ii) $1005 + 283 = \mathbf{283} + 1005$
(iii) Do yourself.
3. to **6.**; Do yourself.
7. The largest eight digit number = 99999999
The smallest nine digit number = 100000000
Difference = $100000000 - 99999999 = \mathbf{1}$
8. Total population of a village = 1500
Number of men = 489
Number of women = 472
Then, number of children = $1500 - (489 + 472)$
 $= 1500 - 961 = \mathbf{539}$

Exercise 2B

1. (i) $45 \times 36 = 45 \times (30 + 6) = 45 \times 30 + 45 \times \mathbf{6}$
(ii) $27 \times 18 = 27 \times (9 + 5 + 4) = 27 \times 9 + 27 \times 5 + 27 \times \mathbf{4}$
(iii) $12 \times 45 = 12 \times (50 - 5) = 12 \times 50 - 12 \times \mathbf{5}$
(iv) $66 \times 85 = 66 \times (90 - 5) = 66 \times 90 - 66 \times \mathbf{5}$
2. (i) $15379 \times 0 = \mathbf{0}$ (ii) $675 \times 47 = 47 \times \mathbf{675}$
(iii) $3709 \times 1 = \mathbf{3709}$ (iv) $42 \times 18 \times 15 = 18 \times \mathbf{15} \times 42$
3. (i) $4 \times 25 \times 761 = 100 \times 761 = \mathbf{76100}$
(ii), (iii) Do yourself.
(iv) $341 \times 625 \times 16 = 341 \times 10000 = \mathbf{3410000}$
(v), (vi) Do yourself.
4. to **8.**; Do yourself.
9. (i) $542 \times 105 = 542 \times (100 + 5)$
 $= 542 \times 100 + 542 \times 5$
 $= 54200 + 2710$
 $= \mathbf{56910}$
(ii), (iii) Do yourself.
(iv) $1006 \times 167 = (1000 + 6) \times 167$
 $= 1000 \times 167 + 6 \times 167$
 $= 167000 + 1002 = \mathbf{168002}$
10. (i) $8165 \times 169 - 8165 \times 69 = 8165 \times (169 - 69)$
 $= 8165 \times 100 = \mathbf{816500}$
(ii) Do yourself.

11. (i) $816 \times 355 = 816 \times (300 + 55) = 816 \times 300 + 816 \times (50 + 5)$
 $= 816 \times 300 + 816 \times 50 + 816 \times 5$
 $= 244800 + 40800 + 4080 = \mathbf{289680}$

(ii) $1042 \times 415 = (1000 + 42) \times 415$
 $= 1000 \times 415 + (50 - 8) \times 415$
 $= 415000 + 50 \times 415 - 8 \times 415$
 $= 415000 + 20750 - 3320 = \mathbf{432430}$

(iii), (iv) Do yourself.

12. $LHS = 1 + 2 + 3 + \dots + n$

If $n = 15$, then

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 = 120$$

$$RHS = \frac{n(n+1)}{2}$$

If $n = 15$, then $\frac{15(15+1)}{2} = \frac{15 \times 16}{2} = \mathbf{120}$

13. $LHS = (a + b) \times (a - b)$

If $a = 45$, $b = 2$, then

$$(48 + 2) \times (48 - 2) = 50 \times 46 = 2300$$

$$RHS = (a \times a) - (b \times b) = (48 \times 48) - (2 \times 2)$$

$$= 2304 - 4 = \mathbf{2300}$$

14. Proceed as question 13.

Exercise 2C

1. Do yourself.

2. (i), (ii) Do yourself.

(iii) $476 + (430 \div 43) = 476 + 10 = \mathbf{486}$

(iv) $682 - (8866 \div 13) = 682 - 682 = \mathbf{0}$

(v) $(1465 \div 1465) - (1465 \div 1465) = 1 - 1 = \mathbf{0}$

(vi) $(15625 \div 125) \div 125 = 125 \div 125 = \mathbf{1}$

3. (i) $3772 \div 23$

$$\begin{array}{r} 23 \overline{)3772} 164 \\ \underline{147} \\ 138 \\ \underline{92} \\ 92 \\ \underline{92} \\ \times \end{array}$$

Quotient = **164**

Remainder = **0**

(vi) Do yourself.

(ii), (iii), (iv) Do yourself.

(v) $16025 \div 1000$

$$\begin{array}{r} 1000 \overline{)16025} 16 \\ \underline{1000} \\ 6025 \\ \underline{6000} \\ 25 \end{array}$$

Quotient = **16**

Remainder = **25**

4. Five-digit greatest number = 99999

Then

$$\begin{array}{r} 50 \overline{)99999} 999 \\ \underline{50} \\ 499 \\ \underline{450} \\ 499 \\ \underline{450} \\ 499 \\ \underline{450} \\ 49 \end{array}$$

To make five-digit greatest number which is exactly divisible by 50 we will have to subtract 49 to the dividend to make it divisible exactly. So, the greatest five-digit number would be $99999 - 49 = \mathbf{99950}$

5. Six-digit least number = 100000

$$\begin{array}{r} 75 \overline{)100000} 333 \\ \underline{75} \\ 250 \\ \underline{225} \\ 250 \\ \underline{225} \\ 250 \\ \underline{225} \\ 25 \end{array}$$

To make six-digit least number exactly divisible, we will have to add 50 to the dividend to make it divisible exactly. So, the least six-digit number would be $100000 + 50 = \mathbf{100050}$.

6. Dividend = Divisor \times Quotient + Remainder
 $= 25 \times 25 + 16$
 $= 625 + 16 = \mathbf{641}$

7. Total trees = 570; Total rows = 19
Then, the number of trees in each row = $\frac{570}{19} = \mathbf{30 \text{ trees}}$.

Thus, number of trees in each row is 30 trees.

8. Do yourself.

9. Do yourself.

10. $(a \times a \times a - 1) \div (a - 1) = a \times a + a + 1$

Taking $a = 5$, then

$$\begin{aligned} \text{LHS} &= (5 \times 5 \times 5 - 1) \div (5 - 1) \\ &= (125 - 1) \div 4 = 124 \div 4 = 31 \end{aligned}$$

$$\text{RHS} = 5 \times 5 + 5 + 1 = 25 + 5 + 1 = 30 + 1 = 31$$

So,

$$\text{LHS} = \text{RHS}$$

Taking $a = 10$, then

$$\begin{aligned} \text{LHS} &= (10 \times 10 \times 10 - 1) \div (10 - 1) \\ &= (1000 - 1) \div 9 \end{aligned}$$

$$= 999 \div 9 = 111$$

$$\text{RHS} = 10 \times 10 + 10 + 1$$

$$= 100 + 10 + 1 = 111$$

So,

$$\text{LHS} = \text{RHS}$$

Taking $a = 100$, then

$$\text{LHS} = (100 \times 100 \times 100 - 1) \div (100 - 1)$$

$$= (1000000 - 1) \div 99$$

$$= 999999 \div 99 = 10101$$

$$\text{RHS} = 100 \times 100 + 100 + 1$$

$$= 10000 + 100 + 1 = 10101$$

So,

$$\text{LHS} = \text{RHS}$$

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 5.; Do yourself.

6. Total amount of money Sachin had = ₹ 61000

Given to Virat = ₹ 8750

Given to Rahul = ₹ 12638

Given to Rohit = ₹ 35000

Left Money = ₹ 61000 - ₹ (8750 + 12638 + 35000)

$$= 61000 - 56388 = \text{₹ } \mathbf{4612}$$

7. Do yourself.

8. Largest four digit number = 9999

On dividing by 17 to 9999

Remainder = 3

So, largest four digit number exactly divisible by 17

$$= 9999 - 3 = \mathbf{9996}$$

Smallest four digit number = 1000

To make the smallest four digit number

exactly divisible, we will have to add 3 to dividend

So,

$$1000 + 3 = \mathbf{1003}$$

Thus, 9996 is the largest four digit number and 1003 is the smallest four digit number which is exactly divisible by 17.

9.

Population of a town = 450772

Number of educated persons = 1 out of every 14

$$\text{So, educated persons in the town} = \frac{450772}{14} = \mathbf{32198}$$

Thus, 32198 persons are educated in the town.

3.

Playing with Numbers

Exercise 3A

1. (i) Factors of 50

$$50 = 1 \times 50 = 2 \times 25 = 5 \times 10 \\ = 1, 2, 5, 10, 25, 50$$

(ii) and (iii) Do yourself.

- (iv) Factors of 89

$$89 = 1 \times 89 = 1, 89$$

(v), (vi) and (vii) Do yourself.

- (viii) Factors of 243

$$243 = 1 \times 243 = 3 \times 81 = 9 \times 27 \\ = 1, 3, 9, 27, 81, 243$$

2. to 3. Do yourself.

4. (i) First five multiples of 15

$$15 \times 1 = 15, 15 \times 2 = 30, 15 \times 3 = 45, 15 \times 4 = 60, 15 \times 5 = 75 \\ \text{Thus, } 15, 30, 45, 60, 75 \text{ are first five multiples of } 15.$$

(ii), (iii) and (iv) Do yourself.

- (v) First five multiples of 50

$$50 \times 1 = 50, 50 \times 2 = 100, 50 \times 3 = 150, 50 \times 4 \\ = 200, 50 \times 5 = 250$$

Thus, 50, 100, 150, 200, 250 are first five multiples of 50.

5. to 14. Do yourself.

15. Smallest prime number between 10 and 50 = 11

Greatest prime number between 10 and 50 = 47

$$\text{Sum of smallest and greatest prime number between } 10 \text{ and } 50 \\ = 11 + 47 = 58$$

Thus, sum of smallest and greatest prime number between 10 and 50 is 58.

16. Do yourself.

Exercise 3B-3C

Do yourself.

Exercise 3D

1. (i) For the HCF of 16 and 35

Factors of 16 = 2, 2, 2, 2

Factors of 35 = 5, 7

There are no common factor of 16 and 35. So, HCF of 16 and 35 is **1**.

(ii) Do yourself.

(iii) For the HCF of 27 and 75

Factors of 27 = $\textcircled{3}$, 3, 3

Factors of 75 = $\textcircled{3}$, 5, 5

Common factor of 27 and 75 is **3**

Thus, 3 is the HCF of 27 and 75.

(iv) Do yourself.

(v) For the HCF of 24, 36, 45 and 60

Factors of 24 = 2, 2, 2, $\textcircled{3}$

Factors of 36 = 2, 2, $\textcircled{3}$, 3

Factors of 45 = 3, $\textcircled{3}$, 5

Factors of 60 = 2, 2, $\textcircled{3}$, 5

Common factor of 24, 36, 45 and 60 is = **3**

Thus, HCF of 24, 36, 45 and 60 is 3.

(vi) For the HCF of 13, 39 and 273

Factors of 13 = 1, $\textcircled{13}$

Factors of 39 = 3, $\textcircled{13}$

Factors of 273 = 3, 7, $\textcircled{13}$

Common factors of 13, 39 and 273 = **13**

Thus, HCF of 13, 39 and 273 is 13.

2. (i) to (iii) Do yourself.

(iv) For the HCF of 48, 84 and 88

Prime factors of 48 = $\textcircled{2} \times \textcircled{2} \times 2 \times 2 \times 3$

Prime factors of 84 = $\textcircled{2} \times \textcircled{2} \times 3 \times 7$

Prime factors of 88 = $\textcircled{2} \times \textcircled{2} \times 2 \times 11$

Prime factors common to the given numbers are 2, 2

HCF = $2 \times 2 = 4$

Thus, HCF of 48, 84 and 88 is 4.

(v) Do yourself.

(vi) For the HCF of 140, 150 and 210

Prime factors of 140 = $\textcircled{2} \times 2 \times \textcircled{5} \times 7$

Prime factors of 150 = $\textcircled{2} \times 3 \times \textcircled{5} \times 5$

Prime factors of 210 = $\textcircled{2} \times 3 \times \textcircled{5} \times 7$

Prime factors common to the given numbers are 2, 5.

HCF = $2 \times 5 = \mathbf{10}$

Thus, HCF of 140, 150 and 210 is 10.

3. (i) For the HCF of 252 and 576

$$\begin{array}{r}
 252 \overline{)576} \{ 2 \\
 \underline{504} \\
 72 \overline{)252} \{ 3 \\
 \underline{216} \\
 36 \overline{)72} \{ 2 \\
 \underline{72} \\
 \times
 \end{array}$$

Since the last divisor is 36

Thus, HCF of 252 and 576 is 36.

- (ii) and (iii) Do yourself.

- (iv) For the HCF of 2241, 8217 and 747 first we take two smallest number together from all three numbers

$$\begin{array}{r}
 747 \overline{)2241} \{ 3 \\
 \underline{2241} \\
 \times
 \end{array}$$

HCF of 747 and 2241 is 747

Now HCF of 747 and 8217

$$\begin{array}{r}
 747 \overline{)8217} \{ 1 \\
 \underline{747} \\
 747 \overline{)747} \{ 1 \\
 \underline{747} \\
 \times
 \end{array}$$

Thus, HCF of 747, 2241 and 8217 is 747.

5. Two nearest number = $65610 + 27 = 65637$, $65610 - 27$

$$= \mathbf{65583}$$

6. 850, 680 $680 \overline{)850} \{ 1$

$$\begin{array}{r}
 680 \\
 170 \overline{)680} \{ 4 \\
 \underline{680} \\
 \times
 \end{array}$$

HCF = **170**

The maximum capacity of the container which can measure the petrol of tanker in exact number of times = 170.

7. $1343 - 9 = 1334$

$$8593 - 9 = 8584$$

$$\begin{array}{r}
 1334 \overline{)8584} \{ 6 \\
 \underline{8004} \\
 580 \overline{)1334} \{ 2 \\
 \underline{1160} \\
 174 \overline{)580} \{ 3 \\
 \underline{522} \\
 58 \overline{)174} \{ 3 \\
 \underline{174} \\
 \times
 \end{array}$$

HCF = **58**

8. Length = 2 m 67 cm = 267 cm
 Breadth = 4 m 45 cm = 445 cm
 Height = 7 m 12 cm = 712 cm
 267, 445, 712

$$\begin{array}{r} 267 \overline{)445} 1 \\ \underline{267} \\ 178 \overline{)267} 1 \\ \underline{178} \\ 89 \overline{)178} 2 \\ \underline{178} \\ \times \end{array}$$

$$\begin{array}{r} 89 \overline{)712} 8 \\ \underline{712} \\ \times \end{array}$$

HCF = **89**

Thus, the longest tape which can measure the three dimensions of room exactly is **89 cm**.

9. Do yourself. **Ans.** 19
 10. Do yourself.

Exercise 3E

1. (i) 18, 77

$$\begin{array}{r|l} 2 & 18, 77 \\ \hline 3 & 9, 77 \\ \hline 3 & 3, 77 \\ \hline 7 & 1, 77 \\ \hline & 1, 11 \end{array}$$

LCM = $2 \times 3 \times 3 \times 7 \times 11 = \mathbf{1386}$

- (ii), (iii) Do yourself.
 (iv)

$$\begin{array}{r|l} 2 & 6, 15, 18, 30 \\ \hline 3 & 3, 15, 9, 15 \\ \hline 3 & 1, 5, 3, 5 \\ \hline 5 & 1, 5, 1, 5 \\ \hline & 1, 1, 1, 1 \end{array}$$

LCM = $2 \times 3 \times 3 \times 5 = \mathbf{90}$

- (v), (vi), (vii) Proceed as above.
 (viii) 128, 216, 432

$$\begin{array}{r|l} 2 & 128, 216, 432 \\ \hline 2 & 64, 108, 216 \\ \hline 2 & 32, 54, 108 \end{array}$$

2	16, 27, 54
2	8, 27, 27
2	4, 27, 27
2	2, 27, 27
3	1, 27, 27
3	1, 9, 9
3	1, 3, 3
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = \mathbf{3456}$$

2.

2	35, 50, 80
2	35, 25, 40
2	35, 25, 20
2	35, 25, 10
5	35, 25, 5
	7, 5, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 5 \times 7 \times 5 = \mathbf{2800}$$

Hence, remainder is 9 then the required number
 $= 2800 + 9 = \mathbf{2809}$

3. Do yourself. **Ans.** 25

4. I number \times II number = LCM \times HCF

$$64 = 16 \times \text{HCF}$$

$$\text{HCF} = \frac{64}{16} = \mathbf{4}$$

5. Do yourself. **Ans.** 1685

6. No.

7. I number \times II number = LCM \times HCF

$$576 \times 720 = 2880 \times \text{HCF}$$

$$\text{HCF} = \frac{576 \times 720}{2880} = \mathbf{144}$$

Thus, 144 is the HCF of 576 and 720.

8. Do yourself. **Ans.** 5 m

9. For finding the required number we will take HCF of (1796 - 4), (2637 - 5) and (3871 - 7)

HCF of 1792, 2632 and 3864

2	1792, 2632, 3864
2	896, 1316, 1932
2	448, 658, 966
7	224, 329, 483
	32, 47, 69

$$\text{HCF} = 2 \times 2 \times 2 \times 7 = 56$$

Thus, 56 is the required number.

- 10.** Do yourself. **Ans.** 444
11. No, because HCF must be a factor of LCM.
12. Dimension of the largest square tile = HCF of room's length and width

HCF of 6 m 50 cm or 650 cm and 4 m 50 cm or 450 cm

2	650, 450
5	325, 225
5	65, 45
	13, 9

$$\begin{aligned} \text{HCF} &= 2 \times 5 \times 5 \\ &= \mathbf{50 \text{ cm}} \end{aligned}$$

Thus, dimension of largest square tile for room is 50 cm.

- 13.** LCM of 2, 5, 7, 8, 10 and 13 = 3640
 Now above 10000 it is **10920** and below 10000 it is **7280**
 which is exactly divide by 2, 5, 7, 8, 10 and 13.
14. Proceed as question 13.

- 15.** (i)

2	14, 21
3	7, 21
7	7, 7
	1, 1

$$\begin{array}{r} 14 \overline{)21} \{ 1 \\ \underline{14} \\ 7 \overline{)14} \{ 2 \\ \underline{14} \\ \times \end{array}$$

$$\begin{aligned} \text{LCM} &= 2 \times 3 \times 7 = \mathbf{42} \\ \text{Product} &= \text{HCF} \times \text{LCM} \\ 14 \times 21 &= 42 \times 7 \\ 294 &= 294 \end{aligned}$$

(ii), (iii) and (iv) proceed as above.

- 16.** Do yourself. **Ans.** 2048

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 7.; Do yourself.
8. Greatest number that divides 180, 225 and 315 completely
= HCF of 180, 225 and 315

The HCF of 180, 225 and 315

$$\begin{array}{r|l} 5 & 180, 225, 315 \\ \hline 9 & 36, 45, 63 \\ \hline & 4, 5, 7 \end{array}$$

$$\text{HCF} = 5 \times 9 = \mathbf{45}$$

Thus, 45 is the greatest number that divides 180, 225 and 315 completely.

9. Product of two numbers = LCM \times HCF
 $19200 = \text{LCM} \times 40$
 $\text{LCM} = \frac{19200}{40} = \mathbf{480}$

Thus, 480 is the LCM.

10. Product of two numbers = LCM \times HCF
 $43776 = 7296 \times \text{HCF}$
 $\text{HCF} = \frac{43776}{7296} = \mathbf{6}$

Thus, 6 is the HCF.

4.

Integers

Exercise 4A

Do yourself.

Exercise 4B

1. (i) $10001 + (-2) = \mathbf{9999}$ (ii) $-99005 + 360 = -\mathbf{98645}$
(iii), (iv), (v), (vi), (vii), (viii), (ix) Do yourself.
(x) $-623, -5832, 623 = -(623 + 5832) + 623$
 $= -6455 + 623 = -\mathbf{5832}$
(xi) $-982 + 1934 + (-18) + (-2034)$
 $= -982 + 1934 - 18 - 2034$
 $= 1934 - (982 + 18 + 2034)$
 $= 1934 - 3034 = -\mathbf{1100}$
2. (i) $908 + (-8) + (-1) + 1 + (-300) = 908 - 8 - 1 + 1 - 300$
 $= 908 + 1 - (8 + 1 + 300)$
 $= 909 - 309 = \mathbf{600}$
- (ii) Do yourself.
(iii) $100 + (-66) + (-34) = 100 - 66 - 34$

$$=100 - (66 + 34)$$

$$= 100 - 100 = \mathbf{0}$$

(iv), (v) Do yourself.

$$\begin{aligned} \text{(vi) } 1 + (-475) + (-475) + (-475) + (-475) + 1900 \\ = 1 + 1900 - (475 + 475 + 475 + 475) \\ = 1901 - 1900 = \mathbf{1} \end{aligned}$$

(vii), (viii), (ix) Do yourself.

$$\begin{aligned} \text{(x) } (-1) + (-304) + 304 + 304 + (-304) + 1 \\ = -1 - 304 + 304 + 304 - 304 + 1 \\ = (304 + 304 + 1) - (304 + 304 + 1) \\ = 609 - 609 = \mathbf{0} \end{aligned}$$

3. to **5.**; Do yourself.

$$\begin{aligned} \mathbf{6.} \quad \text{Sum of two integers} &= 145 \\ \text{First integer} &= -39 \\ \text{Let other integer} &= x \\ \text{Then, } x + (-39) &= 145 \\ x - 39 &= 145 \\ x &= 145 + 39 = \mathbf{184} \end{aligned}$$

Thus, 184 is the other integer.

$$\begin{aligned} \mathbf{7.} \quad \text{Sum of } -36 \text{ and } 114 &= -36 + 114 = 78 \\ \text{Sum of } -128 \text{ and } 59 &= -128 + 59 = -69 \\ \text{Then, } -69 - 78 &= -\mathbf{147} \end{aligned}$$

8. and **9.** Do yourself.

$$\begin{aligned} \mathbf{10.} \quad \text{Difference of } -39 \text{ and } 64 &= -39 - 64 = -103 \\ \text{Addition of } -116 \text{ and } -103 &= (-116) + (-103) = -\mathbf{219} \end{aligned}$$

11. and **12.** Do yourself.

$$\begin{aligned} \mathbf{13.} \quad \text{Here two integers } x \text{ and } y \text{ are such that } x \text{ is the successor of } y \\ \text{Then, } x = y + 1 \\ \text{Given equation} = x - y + 2 \\ \text{put the value of } x \text{ in given equation} \\ = y + 1 - y + 2 \\ 1 + 2 = \mathbf{3} \end{aligned}$$

Thus, 3 is the value of given equation.

Exercise 4C

1. Do yourself.

$$\begin{aligned} \mathbf{2.} \quad \text{(i) } (-8) \times 0 \times 37 \times (-37) &= \mathbf{0} \\ \text{(ii) } (1569 \times 887) - (569 \times 887) &= 887 \times (1569 - 569) \\ &= 887 \times 1000 = \mathbf{887000} \end{aligned}$$

(iii), (iv) Do yourself.

$$\text{(v) } 15625 \times (-2) + (-15625) \times 98 = 15625 \times (-2 - 98)$$

$$= 15625 \times (-100)$$

$$= -1562500$$

$$(vi) \quad (-80 \times (10 - 5 - 43 + 98)) = (-80) \times (108 - 48)$$

$$= (-80) \times (60) = -4800$$

3. (i) $2 \times (-15) = -30$

(ii) Do yourself.

(iii) $(-17) \times (-20) = 340$

(iv), (v) Do yourself.

(vi) $(-12) \times (-12) \times (-12) = -1728$

(vii), (viii), (ix), (x) Do yourself.

(xi) $(-1) \times (-2) \times (-3) \times (-4) \times (-5) = -120$

(xii) Do yourself.

7. Product of two integers = 1728

$$\text{One of them} = -24$$

$$\text{Let other integer} = x$$

$$\text{Then, } x \times (-24) = 1728$$

$$x = \frac{1728}{-24} = -72$$

Thus, -72 is the other integer.

8. Let the required integer = x

$$\text{Then, } \frac{x}{-1} = -124$$

$$x = (-124) \times (-1) = 124$$

Thus, 124 is the required integer.

9. Let the other integer = x

$$\text{Then, } -23 \times x = -1495$$

$$x = \frac{-1495}{-23} = 65$$

Thus, other integer is 65 .

10. Let the integer = x

$$\text{Then, } x \times (-1) = -325$$

$$x = \frac{-325}{-1} = 325$$

Thus, required integer is 325 .

11. Positive

Exercise 4D

Do yourself.

Multiple Choice Questions

Do yourself.

Revision Exercise

Do yourself.

5.

Fractions

Exercise 5A-5D

Do yourself.

Exercise 5E

$$\begin{aligned} 1. \quad 12 - [9 - \{15 - (12 - 9 - 5)\}] \\ &= 12 - [9 - \{15 - (12 - 4)\}] \\ &= 12 - [9 - \{15 - 8\}] \\ &= 12 - [9 - 7] = 12 - 2 = \mathbf{10} \end{aligned}$$

2. Do yourself. **Ans.** $\frac{1}{10}$

$$\begin{aligned} 3. \quad 11\frac{3}{4} \div \left[5\frac{1}{6} + \left\{ 3\frac{1}{2} - \left(1\frac{2}{3} + \frac{3}{2} \right) \right\} \right] \\ &= \frac{47}{4} \div \left[\frac{31}{6} + \left\{ \frac{7}{2} - \left(\frac{19}{6} \right) \right\} \right] \\ &= \frac{47}{4} \div \left[\frac{31}{6} + \left\{ \frac{21 - 19}{6} \right\} \right] \\ &= \frac{47}{4} \div \left[\frac{31}{6} + \frac{2}{6} \right] = \frac{47}{4} \div \left[\frac{31 + 2}{6} \right] \\ &= \frac{47}{4} \div \frac{33}{6} = \frac{47}{4} \times \frac{6}{33} = \frac{47}{4} \times \frac{2}{11} = \frac{47}{2} \times \frac{1}{11} = \frac{47}{22} = \mathbf{2\frac{3}{22}} \end{aligned}$$

4. Do yourself. **Ans.** $-17\frac{7}{24}$

5. Do yourself. **Ans.** $-3\frac{34}{45}$

$$\begin{aligned} 6. \quad 4\frac{1}{2} - \left[5\frac{1}{4} \div \left\{ 2\frac{1}{2} - \frac{1}{12} \text{ of } \left(\frac{5}{2} \right) \right\} \right] \\ &= \frac{9}{2} - \left[\frac{21}{4} \div \left\{ \frac{5}{2} - \frac{1}{12} \times \frac{5}{2} \right\} \right] \\ &= \frac{9}{2} - \left[\frac{21}{4} \div \left\{ \frac{5}{2} - \frac{5}{24} \right\} \right] \\ &= \frac{9}{2} - \left[\frac{21}{4} \div \left\{ \frac{60 - 5}{24} \right\} \right] \\ &= \frac{9}{2} - \left[\frac{21}{4} \times \frac{24}{55} \right] = \frac{9}{2} - \left[\frac{21}{1} \times \frac{6}{55} \right] = \frac{9}{2} - \left[\frac{126}{55} \right] \\ &= \frac{495 - 252}{110} = \frac{243}{110} = \mathbf{2\frac{23}{110}} \end{aligned}$$

7. Do yourself. **Ans.** $3\frac{26}{27}$

Exercise 5F

1. Length of ribbon Ekta bought = $\frac{2}{5}$ m
 Length of ribbon Lipika bought = $\frac{3}{4}$ m
 Total length of ribbon they bought = $\frac{2}{5} + \frac{3}{4} = \frac{8 + 15}{20} = \frac{23}{20}$ m
 Or **$1\frac{3}{20}$ m**
 Thus, total length of ribbon is $1\frac{3}{20}$ m.
2. Length of bamboo = $2\frac{3}{4}$ m = $\frac{11}{4}$ m
 Length of one piece = $\frac{7}{8}$ m
 Length of other piece = Total length – length of one piece
 = $\frac{11}{4} - \frac{7}{8} = \frac{22 - 7}{8} = \frac{15}{8}$ m = **$1\frac{7}{8}$ m**
 Thus, length of other piece is $1\frac{7}{8}$ m.
3. Length of the rope = $20\frac{1}{2}$ m = $\frac{41}{2}$ m
 Length of piece cutted from it = $3\frac{5}{8} = \frac{29}{8}$ m
 Length of the remaining rope = $\frac{41}{2}$ m – $\frac{29}{8}$ m
 = $\frac{164 - 29}{8} = \frac{135}{8} = \mathbf{16\frac{7}{8}}$ m
 Thus, length of the remaining rope is $16\frac{7}{8}$ m.
4. Distance of school from Juhi's house = $1\frac{9}{10}$ km = $\frac{19}{10}$ km
 Distance travelled by bus = $1\frac{1}{2}$ km = $\frac{3}{2}$ km
 Distance she walked = $\frac{19}{10} - \frac{3}{2} = \frac{19 - 15}{10} = \frac{4}{10}$ km or **$\frac{2}{5}$ km**
5. Total money earned by labourer = ₹ $58\frac{1}{2}$ = ₹ $\frac{117}{2}$
 Money spent on food ₹ $18\frac{3}{4}$ = ₹ $\frac{75}{4}$

$$\text{Money spent on other needs} = ₹ 6 \frac{1}{5} = ₹ \frac{31}{5}$$

$$\text{Total money spent by him} = \frac{75}{4} + \frac{31}{5} = \frac{375 + 124}{20} = ₹ \frac{499}{20}$$

$$\begin{aligned} \text{Amount of money left with him} &= ₹ \frac{117}{2} - ₹ \frac{499}{20} = \frac{1170 - 499}{20} \\ &= ₹ \frac{671}{20} \text{ or } ₹ \mathbf{33 \frac{11}{20}} \end{aligned}$$

Thus, ₹ $33 \frac{11}{20}$ left with him.

6. Do yourself. **Ans.** $11 \frac{29}{60}$ kg

7. In $\frac{3}{4}$ part journey covered = 12 km

$$\text{In 1 part journey covered} = \frac{12}{3/4} = \frac{12 \times 4}{3} = 16 \text{ km}$$

So, distance is still left to be covered = 16 km – 12 km = **4 km**

Thus, 4 km distance is still left to be covered.

8. Number of pages read by Madhuri = 25

Total number of pages book contains = 100

$$\text{Part read by Ayushi} = \frac{2}{5}$$

$$\text{So, number of pages read by Ayushi} = 100 \times \frac{2}{5} = 40$$

Thus, Madhuri read less pages.

9. Earning of a man in a particular month = ₹ 7200

$$\frac{3}{10} \text{ part spent on food} = 7200 \times \frac{3}{10} = ₹ 2160$$

$$\frac{1}{4} \text{ part spent on rent} = 7200 \times \frac{1}{4} = ₹ 1800$$

$$\frac{1}{10} \text{ part spent on insurance} = 7200 \times \frac{1}{10} = ₹ 720$$

$$\frac{2}{25} \text{ part spent on holiday} = 7200 \times \frac{2}{25} = ₹ 576$$

$$\begin{aligned} \text{Total money spent by him} &= ₹ 2160 + ₹ 1800 + ₹ 720 + ₹ 576 \\ &= ₹ 5256 \end{aligned}$$

Saving = Total earning – Total expenses

$$\text{Saving} = ₹ 7200 - ₹ 5256$$

$$\text{Saving} = ₹ \mathbf{1944}$$

Thus, ₹ 1944 is the total savings of man.

10. Do yourself. **Ans.** Rohit, $\frac{1}{4}$ hour

11. Do yourself. **Ans.** $\frac{2}{7}$

12. Part of boys students = $\frac{4}{5}$

So, part of girl students = $1 - \frac{4}{5} = \frac{1}{5}$

Number of girls = 100

$\frac{1}{5}$ part of girls students = 100

1 part of students = $\frac{100}{1/5} = 100 \times 5 = 500$

$\frac{4}{5}$ part of boys students = $500 \times \frac{4}{5} = 400$

Thus, number of boys students is 400.

13. Part of journey still remain = $\frac{1}{4}$

Part of journey covered = $1 - \frac{1}{4} = \frac{3}{4}$

In $\frac{3}{4}$ part of journey travelled = 15 km

1 part of journey travelled = $\frac{15}{3/4} = \frac{15 \times 4}{3} = 20$ km

Thus, 20 km is the full length of journey.

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 9.; Do yourself.

10. (i) Do yourself.

$$\begin{aligned} \text{(ii) } 21 \frac{1}{9} \div \left[\frac{5}{9} \text{ of } \left\{ 3 \frac{1}{27} - \left(6 - \frac{1}{3} - \frac{1}{6} \right) \right\} \right] \\ = \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \left(6 - \frac{2-1}{6} \right) \right\} \right] \\ = \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \left(6 - \frac{1}{6} \right) \right\} \right] \end{aligned}$$

$$\begin{aligned}
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \frac{35}{6} \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{164 - 315}{54} \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \times \left(\frac{-151}{54} \right) \right] \\
 &= \frac{190}{9} \div \left[\frac{-755}{486} \right] = \frac{190}{9} \times \left(\frac{-486}{755} \right) = \frac{38}{1} \times \left(\frac{-54}{151} \right) \\
 &= \frac{38 \times (-54)}{151} = -\frac{2052}{151} = -13 \frac{89}{151}
 \end{aligned}$$

11. Length of rope = $10 \frac{1}{2} \text{ m} = \frac{21}{2} \text{ m}$

Cutting length of rope = $4 \frac{5}{8} \text{ m} = \frac{37}{8} \text{ m}$

Length of remaining rope = Total length of rope

$$\begin{aligned}
 &\quad\quad\quad\quad\quad\quad\quad\quad\quad - \text{cutting length of rope} \\
 &= \frac{21}{2} - \frac{37}{8} = \frac{84 - 37}{8} = \frac{47}{8} \text{ m or } 5 \frac{7}{8} \text{ m}
 \end{aligned}$$

Thus, length of the remaining rope is $5 \frac{7}{8} \text{ m}$.

12. Total number of oranges in box = 500

Part of rotten oranges = $\frac{3}{25}$

Total number of rotten oranges = $500 \times \frac{3}{25} = 60$

Part of oranges kept for some guests = $\frac{1}{5}$

Total number of oranges kept for some guests = $500 \times \frac{1}{5} = 100$

Number of oranges left in the box = $500 - (60 + 100) = 340$

Thus, 340 oranges left in the box.

6.

Decimals

Exercise 6A-6D

Do yourself.

Exercise 6E

1. Amount of purchasing apples = 5 kg and 50 g
 Amount of purchasing grapes = 2 kg and 300 g
 Amount of purchasing guavas = 2 kg and 10 g

$$\begin{array}{r}
 \text{Total amount of the fruits} = 5 \text{ kg } 50 \text{ g} \\
 \phantom{\text{Total amount of the fruits}} = 2 \text{ kg } 300 \text{ g} \\
 \phantom{\text{Total amount of the fruits}} + 2 \text{ kg } 10 \text{ g} \\
 \hline
 \phantom{\text{Total amount of the fruits}} = 9 \text{ kg } 360 \text{ g}
 \end{array}$$

Total amount of the fruits is **9 kg 360 g**.

$$\begin{array}{r}
 \text{Difference between 10 kg and total amount of the fruits.} \\
 = 10 \text{ kg} - 9 \text{ kg } 360 \text{ g} \\
 = 10000 \text{ g} - 9360 \text{ g} = \mathbf{640 \text{ g}}
 \end{array}$$

Remaining amount of the fruits is 640 g or 0.64 kg.

2. Cloth bought by Lipika for shirt = 2 m 70 cm

Cloth bought by Lipika for trousers = 2 m 85 cm

Total length of the cloth bought by her

$$\begin{array}{r}
 = 2 \text{ m } 70 \text{ cm} + 2 \text{ m } 85 \text{ cm} \\
 = \mathbf{5 \text{ m } 55 \text{ cm}} \text{ or } \mathbf{5.55 \text{ m}}
 \end{array}$$

Thus, total length of cloth is 5 m 55 cm or **5.55 m**.

3. Price of a notebook = ₹ 21.50

Price of a pencil = ₹ 2.75

Price of a book = ₹ 32.05

$$\begin{array}{r}
 \text{Then, total price} = ₹ (21.50 + 2.75 + 32.05) \\
 = \mathbf{₹ 56.30}
 \end{array}$$

$$\begin{array}{r}
 \text{If the price is paid by a 100 rupee note then change will be} \\
 = ₹ (100 - 56.30) = \mathbf{₹ 43.70}
 \end{array}$$

Thus, change would be ₹ 43.70.

4. Quantity of apples = 4 kg 90 g = 4.090 kg

Quantity of grapes = 2 kg 60 g = 2.060 kg

Quantity of mangoes = 5 kg 300 g = 5.300 kg

$$\begin{array}{r}
 \text{Total weight of all the fruits he bought} = 4.090 + 2.060 + 5.300 \\
 = \mathbf{11.450 \text{ kg}}
 \end{array}$$

Thus, Rahul bought 11.450 kg or 11 kg 450 g fruits in all.

5. Length of cloth Ekta had = 20 m 5 cm = 20.05 m

Cuttet length from it = 4 m 50 cm = 4.50 m

$$\text{Length of cloth left with her} = 20.05 - 4.50 = \mathbf{15.55 \text{ m}}$$

Thus, 15.55 m length of cloth left with her.

6. Distance travelled by bus = 15 km 268 m = 15.268 km

Distance travelled by car = 7 km 7 m = 7.007 km

Distance travelled by foot = 500 m = 0.500 km

Distance of her school from residence

$$\begin{array}{r}
 = 15.268 + 7.007 + 0.500 \\
 = \mathbf{22.775 \text{ km}}
 \end{array}$$

Thus, 22.775 is the distance of Palak's school from her residence.

7. Do yourself. **Ans.** ₹ 6.75

8. Weight of watermelon = 5 kg 300 g = 5.300 g
Weight of watermelon given to neighbour
= 2 kg 680 g = 2.680 kg

Weight of watermelon left with Riya
= 5.300 - 2.680 = **2.620 kg**

Thus, 2.620 kg weight of the watermelon left with Riya.

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 9.; Do yourself.

10. Distance travelled by foot = 2 km 45 m = 2.045 km

Distance travelled by bus = 30 km = 30.000 km

Distance travelled by autorickshaw = 4 km 990 m = 4.990 km

Then distance of his office from home = 2.045 + 30.000 + 4.990
= 37.035 km

Thus, distance of Rajesh's office from home is 37.035 km.

11. Amount of money Ridhi has = 100 rupee note

Cost of a soap bought by her = ₹ 17.63

Cost of sugar bought by her = ₹ 19.50

Total money spent by her = ₹ 17.63 + ₹ 19.50
= ₹ 37.13

So, shopkeeper will return the change to her

= ₹ 100 - ₹ 37.13 = ₹ **62.87**

Thus, ₹ 62.87 will return the shopkeeper as change to Ridhi.

7. Algebraic Expressions

Exercise 7A-7C

Do yourself.

Exercise 7D

1. (i) $12b - 7b - 3b = b(12 - 7 - 3) = b(12 - 10) = 2b$

(ii) Do yourself.

(iii) $2a - (b - a) - b - (a - b) = 2a - b + a - b - a + b = 2a - b$

(iv) Do yourself.

(v) $10m^2 - 9m + 7m - 3m^2 - 5m - 8$

= $10m^2 - 3m^2 - 9m + 7m - 5m - 8$

$$= m^2(10 - 3) + m(-9 + 7 - 5) - 8$$

$$= \mathbf{7m^2 - 7m - 8}$$

(vi), (vii) Do yourself.

$$(viii) xy^2 - y^2 + x^2 + xy^2 - 4y^2 - x^2 - 7$$

$$= xy^2 + xy^2 - y^2 - 4y^2 + x^2 - x^2 - 7$$

$$= \mathbf{2xy^2 - 5y^2 - 7}$$

2. (i) $y^3, -2y^3, -3y^3, 4y^3;$

$$\text{On adding} \Rightarrow y^3 - 2y^3 - 3y^3 + 4y^3 = y^3(1 - 2 - 3 + 4)$$

$$= y^3(5 - 5) = y^3 \times 0 = \mathbf{0}$$

(ii), (iii) Do yourself.

(iv) $x^2y - 3x + 4, -8x^2y + 3x - 4;$

$$\text{On adding} \Rightarrow x^2y - 3x + 4 + (-8x^2y + 3x - 4)$$

$$= x^2y - 3x + 4 - 8x^2y + 3x - 4$$

$$= x^2y - 8x^2y - 3x + 3x - 4 + 4$$

$$= x^2y(1 - 8) - 3x + 3x - 4 + 4 = \mathbf{-7x^2y}$$

(v) Do yourself.

3. We should added $2x^2 + 3xy - (x^2 + xy + y^2)$

$$= 2x^2 - x^2 + 3xy - xy - y^2$$

$$= \mathbf{x^2 + 2xy - y^2}$$

4. Do yourself.

5. $2a^2 + 3b^2 + 5a^2 - 2b^2 + ab + (-6a^2 - 5ab + b^2)$

$$= 2a^2 + 3b^2 + 5a^2 - 2b^2 + ab - 6a^2 - 5ab + b^2$$

$$= 2a^2 + 5a^2 - 6a^2 + 3b^2 - 2b^2 + b^2 + ab - 5ab$$

$$= a^2(2 + 5 - 6) + b^2(3 - 2 + 1) + ab(1 - 5)$$

$$= \mathbf{a^2 + 2b^2 - 4ab}$$

6. $(3x^2 - 5y^2 - 4xy) - (5xy - 4x^2 + 3y^2)$

$$= 3x^2 + 4x^2 - 5y^2 - 3y^2 - 4xy - 5xy$$

$$= \mathbf{7x^2 - 8y^2 - 9xy}$$

7. to 8.; Do yourself.

9. Sum of $(2x^2 + 3xy), (-x^2 - xy - y^2)$ and $xy + 2y^2$

$$= (2x^2 + 3xy) + (-x^2 - xy - y^2) + (xy + 2y^2)$$

$$= 2x^2 - x^2 + 3xy - xy + xy - y^2 + 2y^2$$

$$= \mathbf{x^2 + 3xy + y^2}$$

$$\begin{aligned}
 &\text{Sum of } (3x^2 - y^2) \text{ and } (-x^2 + xy + y^2) \\
 &= (3x^2 - y^2) + (-x^2 + xy + y^2) \\
 &= (3x^2 - x^2 + xy - y^2 + y^2) \\
 &= 2x^2 + xy
 \end{aligned}$$

So on subtraction

$$\begin{aligned}
 &(x^2 + 3xy + y^2) - (2x^2 + xy) \\
 &= x^2 - 2x^2 + 3xy - xy + y^2 \\
 &= -x^2 + 2xy + y^2
 \end{aligned}$$

10. Do yourself.

11. $A = 3x^2 - 7x + 8, B = x^2 + 8x - 3, C = -5x^2 - 3x + 2$

$$\begin{aligned}
 B - C - A &= (x^2 + 8x - 3) - (-5x^2 - 3x + 2) - (3x^2 - 7x + 8) \\
 &= x^2 + 8x - 3 + 5x^2 + 3x - 2 - 3x^2 + 7x - 8 \\
 &= x^2 + 5x^2 - 3x^2 + 8x + 3x + 7x - 3 - 2 - 8 \\
 &= 3x^2 + 18x - 13
 \end{aligned}$$

12. $a = x - 2, b = y + 2$ and $c = -x + 2y$

$$\begin{aligned}
 \text{L.H.S. } a + b + c &= (x - 2) + (y + 2) + (-x + 2y) \\
 &= x - 2 + y + 2 - x + 2y \\
 &= y + 2y = 3y = \text{R.H.S.}
 \end{aligned}$$

Multiple Choice Questions

Do yourself.

Revision Exercise

1.

Let age of Parul = x years

Then, age of Palak = $(x - 5)$ years

Thus, age of Palak is $(x - 5)$ years.

2. Do yourself. **Ans.** $(3x + 7)$

3. Let she scores in Science = x marks

$$\text{Then, scores in Mathematics} = \frac{3}{4}x + 15$$

Thus, scores in Mathematics is $\left(\frac{3}{4}x + 15\right)$.

4. Do yourself. **Ans.** $56x$

5. Do yourself. **Ans.** $(x - 6)$ year

6. Do yourself. **Ans.** $(t + y), (t - 4), (4 - t), 4t, \frac{t}{4}, \frac{4}{t}$

7. Do yourself. **Ans.** 1080

8. $x = -1, y = -2$ and $z = 3$

$$\begin{aligned} \text{Value of } x^2 - yz - zx &= (-1)^2 - (-2)(3) - 3(-1) \\ &= 1 + 6 + 3 = 10 \end{aligned}$$

Thus, value of $x^2 - yz - zx$ is 10.

8. Linear Equations

Exercise 8A

Do yourself.

Exercise 8B

1. (i) $\frac{7u + 3}{2} = 19$

$$7u + 3 = 38 \Rightarrow 7u = 38 - 3 \Rightarrow 7u = 35$$

$$\Rightarrow u = \frac{35}{7} \Rightarrow u = \mathbf{5}$$

(ii) Do yourself.

(iii) $\frac{x}{7} - 2 = 5 \Rightarrow \frac{x}{7} = 5 + 2 \Rightarrow \frac{x}{7} = 7 \Rightarrow x = \mathbf{49}$

(iv), (v) Do yourself.

(vi) $12y - 3 = 5(2y + 1) \Rightarrow 12y - 3 = 10y + 5;$
 $12y - 10y = 5 + 3 \Rightarrow 2y = 8;$
 $y = \frac{8}{2} = \mathbf{4}$

2. (i) $3x + 8 = 14$

$$\Rightarrow 3x = 14 - 8 \Rightarrow 3x = 6 \Rightarrow x = \frac{6}{3} = \mathbf{2}$$

(ii) Do yourself.

(iii) $\frac{m}{7} - 3 = 8$

$$\Rightarrow \frac{m}{7} = 8 + 3$$

$$\Rightarrow \frac{m}{7} = 11$$

$$\Rightarrow m = 11 \times 7 = \mathbf{77}$$

(iv) $\frac{x}{3} + \frac{x}{4} = 14$

$$\Rightarrow \frac{4x + 3x}{12} = 14$$

$$\Rightarrow 7x = 14 \times 12$$

$$\Rightarrow x = \frac{14 \times 12}{7} = \mathbf{24}$$

(v) Do yourself.

$$\begin{aligned}
 \text{(vi)} \quad 2m - 3 &= \frac{3}{10}(5m - 12) \\
 \Rightarrow 10(2m - 3) &= 3(5m - 12) \\
 \Rightarrow 20m - 30 &= 15m - 36 \\
 \Rightarrow 20m - 15m &= -36 + 30 \\
 \Rightarrow 5m &= -6 \\
 \Rightarrow m &= -\frac{6}{5}
 \end{aligned}$$

3. Let the number = x .

Then, 5 times of $x = 5x$ and 68 less than 5 times that number is $5x - 68$

And according to question it is equal to x

$$\begin{aligned}
 \Rightarrow 5x - 68 &= x \text{ or } 5x - x = 68 \\
 4x &= 68 \Rightarrow x = \frac{68}{4} = \mathbf{17}
 \end{aligned}$$

4. Let the number = x .

We add 142 that number = $x + 142$

Result is 64 more than 3 times that number = $3x + 64$

According to question, $3x + 64 = x + 142$

$$\Rightarrow 3x - x = 142 - 64 \Rightarrow 2x = 78$$

$$\Rightarrow x = \frac{78}{2} = \mathbf{39}$$

5. Let the number = x

Other number is 12 less than that number = $x - 12$

Sum of both numbers = $x + x - 12$

According to question, $x + x - 12 = 48$

$$\Rightarrow 2x = 48 + 12 = 60$$

$$x = \frac{60}{2} = \mathbf{30}$$

and the other number = $30 - 12 = \mathbf{18}$

Thus, number are 18, 30.

6. Let the number = x .

$$\frac{4}{5} \text{ of that number} = \frac{4x}{5}$$

$$\frac{3}{4} \text{ of that number} = \frac{3x}{4}$$

According to question, $\frac{3x}{4} + 5 = \frac{4x}{5}$

$$\Rightarrow \frac{4x}{5} - \frac{3x}{4} = 5 \Rightarrow \frac{16x - 15x}{20} = 5$$

$$\Rightarrow x = \mathbf{100}$$

7. Let one number is x , then other is $x + 2$

According to question, $x + x + 2 = 38$

$$\begin{aligned}\Rightarrow 2x + 2 &= 38 \\ 2x &= 38 - 2 = 36 \\ x &= \frac{36}{2} = \mathbf{18}\end{aligned}$$

So, numbers are 18 and $18 + 2 = \mathbf{20}$.

8. Let one number is x , then other are $x + 2$ and $x + 4$

According to question, $x + x + 2 + x + 4 = 51$

$$\begin{aligned}\Rightarrow 3x + 6 &= 51 \\ \Rightarrow 3x &= 51 - 6 \\ \Rightarrow x &= \frac{45}{3} = \mathbf{15}\end{aligned}$$

So, numbers are **15**, $15 + 2 = \mathbf{17}$ and $15 + 4 = \mathbf{19}$.

9. Let the age of Rahul's younger brother = x years.

Then, the age of Rahul's = $x + 6$ years.

And after ten years with ages are $(x + 10)$ years and $x + 6 + 10$ years

Sum of their ages = $x + 10 + x + 6 + 10$

$\Rightarrow 2x + 26$ years.

According to question $2x + 26 = 50$ years

$$x = \frac{24}{2} = 12 \text{ years}$$

So, age of Rahul's younger brother = **12 years**.

Age of Rahul = $12 + 6 = \mathbf{18}$ years

10. Let the breadth of the rectangle = x m

Length of the rectangle = $(x + 10)$ m

Perimeter of rectangle = $2(x + x + 10) = 2(2x + 10)$
 $= 4x + 20$

According to question, $4x + 20 = 80$ m

$$\Rightarrow 4x = 80 - 20 = 60 \text{ m} \Rightarrow x = \frac{60}{4} = 15 \text{ m}$$

So, the breadth of rectangle = **15 m**

and the length of rectangle = $15 + 10 = \mathbf{25}$ m

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 3.; Do yourself.

4. Let one part is x° , then other is $36^\circ - x^\circ$

$$\begin{aligned} \text{Now} \quad & \frac{1}{5} \times x^\circ = \frac{1}{7} (36^\circ - x^\circ) \\ \text{or} \quad & \frac{x^\circ}{5} = \frac{36^\circ}{7} - \frac{x^\circ}{7} \\ \Rightarrow \quad & \frac{x^\circ}{5} + \frac{x^\circ}{7} = \frac{36^\circ}{7} \Rightarrow \frac{7x^\circ + 5x^\circ}{35} = 180^\circ \\ \Rightarrow \quad & 12x^\circ = 180^\circ \Rightarrow x^\circ = \frac{180^\circ}{12} = \mathbf{15^\circ} \end{aligned}$$

So, one part is 15° and other is $36 - 15 = \mathbf{21^\circ}$.

- 5.** Let the breadth = x cm
 Then, the length = $(x + 3)$ cm
 and area of the rectangle = $x(x + 3)$ cm²
 Now length and breadth are increased by 2 cm
 Then, the breadth = $(x + 2)$ cm
 and the length = $(x + 3 + 2) = (x + 5)$ cm
 The area of the rectangle = $(x + 2)(x + 5)$ cm²

Now according to question,

$$\begin{aligned} (x + 2)(x + 5) &= 70 + x(x + 3) \\ x^2 + 7x + 10 &= 70 + x^2 + 3x \\ 4x + 10 &= 70 \\ x &= \frac{60}{4} = \mathbf{15 \text{ cm}} \end{aligned}$$

and length = $x + 3 = 15 + 3 = \mathbf{18 \text{ cm}}$

- 6.** Let the smallest angle = x°
 Then, second angle = $x^\circ + 45^\circ$
 Third angle = $3x^\circ$
 $x^\circ + x^\circ + 45^\circ + 3x^\circ = 180^\circ$
 $5x^\circ + 45^\circ = 180^\circ$
 $5x^\circ = 180^\circ - 45^\circ = 135^\circ$
 $x^\circ = \frac{135^\circ}{5} = \mathbf{27^\circ}$

Now measures of angle is $\mathbf{27^\circ}$, $27^\circ + 45^\circ = \mathbf{72^\circ}$ and $27^\circ \times 3 = \mathbf{81^\circ}$

- 7.** Let the number of girls in class = x
 Then, the number of boys in class = $\frac{2}{5}x$

According to question,

$$\begin{aligned} \Rightarrow \quad & x + \frac{2}{5}x = 42 \\ \Rightarrow \quad & \frac{5x + 2x}{5} = 42 \end{aligned}$$

$$\Rightarrow 7x = 42 \times 5$$

$$\Rightarrow x = \frac{42 \times 5}{7} = \mathbf{30}$$

$$\text{Number of boys} = \frac{2}{5}x = \frac{2}{5} \times 30 = \mathbf{12}$$

Thus, number of boys in the class 12 and number of girls are 30.

- 8.** Let the base angle = x°
 Now $x^\circ + x^\circ + 80^\circ = 2x^\circ + 80^\circ$
 $2x^\circ + 80^\circ = 180^\circ$
 $\Rightarrow 2x^\circ = 180^\circ - 80^\circ = 100^\circ$
 $\Rightarrow x = \frac{100^\circ}{2} = 50^\circ$
 So, measure of base angle = $\mathbf{50^\circ}$.

9. Ratio and Proportion

Exercise 9A

- 1.** and **2.**; Do yourself.
- 3.** (i) $160000 : 12000 \Rightarrow \mathbf{40 : 3}$ (ii) $12000 : 160000 \Rightarrow \mathbf{3 : 40}$
- 4.** Lecturer's earning = ₹ 14000
 Wife Divya's earning = ₹ 18000
 \therefore Total earning = ₹ $(14000 + 18000) = ₹ 32000$
 (i) $14000 : 32000 \Rightarrow \mathbf{7 : 16}$
 (ii) $18000 : 32000 \Rightarrow \mathbf{9 : 16}$
- 5.** Earning = ₹ 9550
 Saving = ₹ 1850
 Expenditure = ₹ $(9550 - 1850) = ₹ 7700$
 (i) $1850 : 9550 \Rightarrow \mathbf{37 : 191}$ (ii) $9550 : 7700 \Rightarrow \mathbf{191 : 154}$
 (iii) $1850 : 7700 \Rightarrow \mathbf{37 : 154}$
- 6.** Men = 56
 Women = $144 - 56 = 88$
 (i) Ratio of men to women = $56 : 88 = \mathbf{7 : 11}$
 (ii) Ratio of men to total person = $56 : 144 = \mathbf{7 : 18}$
 (iii) Ratio of women to total person = $88 : 144 = \mathbf{11 : 18}$
- 7.** $42 : 1.2 \times 100 \Rightarrow 42 : 120 \Rightarrow \mathbf{7 : 20}$
- 8.** Speed = $\frac{\text{Distance}}{\text{Time}}$
 Speed of car = $\frac{135}{3} = 45 \text{ km/h}$
 Speed of train = $\frac{170}{2} = 85 \text{ km/h}$
 Ratio of their speeds = $\frac{45}{85} = 45 : 85 = \mathbf{9 : 17}$

Exercise 9B

1. and 2.; Do yourself.

3. (i) $4 : 3$, $5 : 4$ and $6 : 7$ or $\frac{4}{3}$, $\frac{5}{4}$ and $\frac{6}{7}$

$$\frac{112, 105, 72}{84}$$

$$84$$

Hence $72 < 105 < 112$ are in ascending order.

So $\frac{6}{7}$, $\frac{5}{4}$ and $\frac{4}{3}$ or $6 : 7$, $5 : 4$ and $4 : 3$ are in ascending order.

(ii) proceed as part (i).

4. According to question, $5x + 3x = 968$

$$8x = 968 \Rightarrow x = \frac{968}{8} = 121$$

So,

$$\text{No. of boys} = 121 \times 5 = \mathbf{605}$$

$$\text{No. of girls} = 121 \times 3 = \mathbf{363}$$

5. Do yourself.

6. Do yourself.

7. Let Naman's age = x years

$$\text{Naman's father's age} = 3x$$

$$\text{The ratio of Naman's and his father's age} = x : 3x = \mathbf{1 : 3}$$

8. Let Sandeep's age is $7x$

Then, Riya's age is $11x$

$$\text{According to question, } 11x = 55 \Rightarrow x = \frac{55}{11} = 5$$

So,

$$\text{Sandeep's age} = 7 \times 5 = \mathbf{35 \text{ years.}}$$

9. An apple cost = ₹ $\frac{200}{12}$

$$\text{An orange cost} = ₹ \frac{80}{10}$$

$$\text{Ratio of apples and oranges cost} = \frac{200}{12} : \frac{80}{10}$$

$$= \frac{5}{12} : \frac{2}{10} = \frac{50 : 24}{120} = \mathbf{25 : 12}$$

So, ratio in apple and orange cost = $25 : 12$.

Exercise 9C

1. (i)

$$16 : 24 = 20 : 30$$

$$\frac{16}{24} = \frac{20}{30} \Rightarrow \frac{\mathbf{2}}{\mathbf{3}} = \frac{\mathbf{2}}{\mathbf{3}}$$

So, it is **true**.

(ii), (iii), (iv), (v), (vi), (vii), (viii), (ix), (x) proceed as part (i).

2. (i) 2, 3, 4, 5

$$\text{Now product of extremes} = 2 \times 5 = 10$$

$$\text{Product of means} = 3 \times 4 = 12$$

Since, the product of extremes are not equal the product of means.

So, 2, 3, 4 and 5 are not in proportion.

(ii), (iii), (iv), (v), (vi) proceed as part (i).

3. Proceed as questions 1.

4. (i) 28, \square , 3.5, 1.5

$$\text{Let } \square = x$$

$$\text{Now product of extremes} = 28 \times 1.5 = 42$$

$$\text{Product of means} = x \times 3.5$$

$$\text{According to question, } x \times 3.5 = 42 \Rightarrow x = \frac{42}{3.5} = \mathbf{12}$$

(ii), (iii), (iv) proceed as part (i).

5. Let fourth term is x .

$$\text{Now product of extreme} = 7 \times x$$

$$\text{and product of means} = 14 \times 25$$

$$\text{According to question, } 7 \times x = 14 \times 25 \Rightarrow x = \frac{14 \times 25}{7} = \mathbf{50}$$

So, fourth term = 50

6. Proceed as question 4.

7. Proceed as question 5.

8. (i) 25, 35, \square

$$\text{Let } \square = x$$

$$\text{then, } 25 \times x = 35 \times 35 \Rightarrow x = \frac{35 \times 35}{25} = \mathbf{49}$$

(ii), (iii), (iv) proceed as part (i).

- 9., 10. proceed as questions 8 (i).

Exercise 9D

1. \because 8 water tankers can be filled in $7\frac{1}{2} = \frac{15}{2}$ hrs

$$\because 1 \text{ water tanker can be filled in } = \frac{15}{2 \times 8} \text{ hrs}$$

$$\because 16 \text{ water tankers can be filled in } = \frac{15}{16} \times 16 = \mathbf{15 \text{ hrs}}$$

- 2., 3., 4., 5. proceed as question 1.

6. Cost of 5 kg of rice = ₹ 130

$$\text{Cost of 1 kg of rice} = \frac{\text{₹ } 130}{5}$$

$$\text{Cost of 24 kg of rice} = \frac{\text{₹ } 130}{5} \times 24 = \text{₹ } 624$$

7.,8., 9., 10. proceed as question 6.

11. 280 quintals of wheat yield in = 6 hectares

$$1 \text{ quintal of wheat yield in} = \frac{6}{280} \text{ hectares}$$

$$225 \text{ quintals of wheat yield in} = \frac{6 \times 225}{280} = \frac{135}{28} \text{ hectares}$$

12.,13., 14. and 15. proceed as question 11.

16. ₹ 19210 is the price of = 17 chairs

$$\text{₹ } 1 \text{ is the price of} = \frac{17}{19210} \text{ chairs}$$

$$\text{₹ } 113000 \text{ is the price of} = \frac{17 \times 113000}{19210} = \text{100 chairs.}$$

17.,18., 19. proceed as question 16.

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 4.; Do yourself.

5. Length of rectangular park = 125 m

Breadth of rectangular park = 60 m

Ratio of the length of the breadth = 125 : 60 = 25 : 12

6. and 7.; Do yourself.

8. On 80 quintals of weight carry charges = ₹ 5400

$$1 \text{ quintal of weight carry charges} = \text{₹ } \frac{5400}{80}$$

$$126 \text{ quintal of weight carry charges} = \frac{5400 \times 126}{80} = \text{₹ } 8505$$

Thus, ₹ 8505 charge to carry 126 quintals of weight.

9. Bananas can be purchased in ₹ 180 = 4 dozen = 48

$$\text{Bananas can be purchased in ₹ } 1 = \frac{48}{180}$$

$$\text{Bananas can be purchased in ₹ } 37.50 = \frac{48 \times 37.50}{180} = \text{10}$$

Thus, 10 bananas can be purchased.

10. Basic Geometrical Ideas

Do yourself.

11.

Angle

Do yourself.

12. Pairs of Lines and Transversals

Exercise 12A

- Only in fig (i) and (iii), (iv) l is a transversal as it intersects two or more given lines in a plane at different points.
- (a) p is a transversal line as it intersects lines l and m at two different points.
(b) EF is a transversal line as it intersects lines AB and CD at two different points.

Exercise 12B

- No, because on extending they will intersect each other.
- (i) $AB \parallel ED, AF \parallel CD, EF \parallel CB$
(ii) $AB \parallel RP, QP \parallel AC, QR \parallel BC$
(iii) $PR \parallel BC, PQ \parallel AC, PR \parallel QC, PQ \parallel RC, PR \parallel BQ, PQ \parallel AR$
(iv) $AB \parallel CD, BC \parallel AD, AE \parallel FC, AF \parallel EC, BC \parallel AF, EC \parallel AD, BE \parallel FD, BE \parallel AF, BE \parallel AD, FD \parallel BC, FD \parallel EC$

Exercise 12C

- $AB \parallel CD$

$$\angle PQC = 35^\circ$$

$$\angle CQP = \angle APR$$

(corresponding angles)

$$\angle RPB = 180^\circ - \angle APR$$

(adjacent angles on a line)

$$\angle RPB = 180^\circ - 35^\circ = \mathbf{145^\circ}$$

Thus, $\angle RPB$ is 145° .

- $\angle b = \angle f$ (Corresponding angles)

$$\therefore \angle f = 65^\circ$$

$$\angle f = \angle d \text{ (Alternate angles)}$$

$$\therefore \angle d = 65^\circ$$

$$\angle d = \angle h$$

(Corresponding angles)

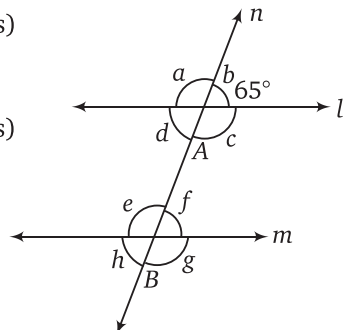
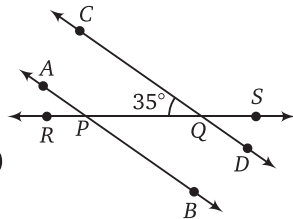
$$\therefore \angle h = 65^\circ$$

$$\angle e + \angle d = \mathbf{180^\circ}$$

(Interior supplementary angles)

$$\angle e + 65^\circ = 180^\circ$$

$$(\because \angle d = 65^\circ)$$



$$\begin{aligned} \therefore \quad \angle e &= 180^\circ - 65^\circ = 115^\circ \\ \angle e &= \angle a \quad (\text{Corresponding angles}) \\ \therefore \quad \angle a &= 115^\circ \\ \angle e &= \angle c \quad (\text{Alternate angles}) \\ \therefore \quad \angle c &= 115^\circ \\ \angle g &= \angle c \quad (\text{Corresponding angles}) \\ \therefore \quad \angle g &= 115^\circ \end{aligned}$$

Thus, $\angle c = \angle g = \angle a = \angle e = 115^\circ$
and $\angle b = \angle f = \angle d = \angle h = 65^\circ$

3. Proceed as question 2.

4. (i) In figure, we have

$$\angle 1 + 135^\circ = 180^\circ$$

(Interior supplementary angles) $m \leftarrow$

$$\angle 1 = 180^\circ - 135^\circ = 45^\circ$$

$$\angle 1 = \angle x$$

(Vertically opposite angles)

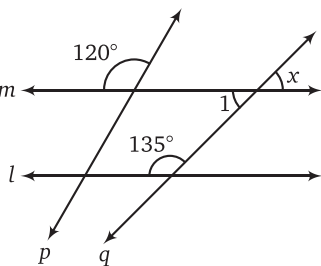
$$\therefore \quad \angle x = 45^\circ$$

(ii) $\angle x = 60^\circ$ (Alternate angles)

5. Do yourself.

6. Do yourself.

7. Do yourself.



Multiple Choice Questions

Do yourself.

Revision Exercise

Do yourself.

13.

Polygon

Do yourself.

14.

Triangle

Do yourself.

15.

Quadrilaterals

Exercise 15A

Do yourself.

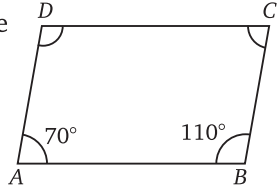
Exercise 15B

1. \therefore Opposite angles of a parallelogram are equal, therefore

$$\angle C = \angle A = 70^\circ$$

and $\angle D = \angle B = 110^\circ$

Thus, other two angles are 70° and 110° .



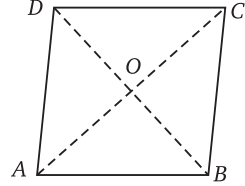
2. In a parallelogram $ABCD$

$$OA = OC \text{ and } OB = OD$$

Given $AC = 12 \text{ cm}$ and $BD = 9 \text{ cm}$

$$OA = OC = \frac{12}{2} = 6 \text{ cm}$$

and $OB = OD = \frac{9}{2} = 4.5 \text{ cm}$



Thus, lengths of OA is 6 cm and length of OD is 4.5 cm.

3. Do yourself. **Ans.** $\angle A = 72^\circ$, $\angle B = 108^\circ$, $\angle C = 72^\circ$ and $\angle D = 108^\circ$.
Since opposite angles are equal, it is a parallelogram

4. In a parallelogram $ABCD$

Given $OA = 6 \text{ cm}$ and $OB = 7.5 \text{ cm}$

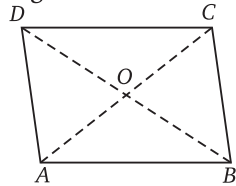
Since for parallelogram

$$OA = OC \text{ and } OB = OD$$

So, $AC = 2 \times OA = 2 \times 6 = 12 \text{ cm}$

$$BD = 2 \times OB = 2 \times 7.5 = 15 \text{ cm}$$

Thus, length of AC is 12 cm and length of BD is 14 cm.



5. Do yourself. **Ans.** 18 cm

6. We know that

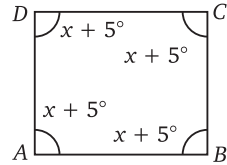
$$\text{Sum of all the angles} = 360^\circ$$

(i) $x + 5^\circ + x + 5^\circ + x + 5^\circ + x + 5 = 360^\circ$

$$4x + 20^\circ = 360^\circ$$

$$4x = 360^\circ - 20^\circ = 340^\circ$$

$$x = \frac{340^\circ}{4} = 85^\circ$$



(ii) Each angle of the quadrilateral $= x + 5^\circ = 85^\circ + 5^\circ = 90^\circ$

7. Do yourself. **Ans.** 90°

8. Do yourself. **Ans.** Rhombus, as all its four sides are equal. The given figure will be a square when any angle of it is 90°

9. In a trapezium $ABCD$

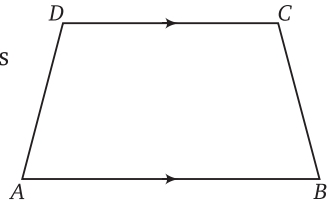
$AB \parallel DC$ and BC and AD is transversal

Given $\angle A = 78^\circ$ and $\angle C = 120^\circ$

$\angle A$ and $\angle D$ are co-interior angles with their sum $= 180^\circ$

i.e. $\angle D + \angle A = 180^\circ$

$$\begin{aligned}\angle D + 78^\circ &= 180^\circ \\ \angle D &= 180^\circ - 78^\circ = \mathbf{102^\circ} \\ \angle B \text{ and } \angle C &\text{ are co-interior angles} \\ &\text{with their sum} = 180^\circ \\ \text{i.e., } \angle C + \angle B &= 180^\circ \\ 120^\circ + \angle B &= 180^\circ \\ \angle B &= 180^\circ - 120^\circ = \mathbf{60^\circ}\end{aligned}$$



Thus, $\angle B$ is 60° and $\angle D$ is 102° .

- 10.** Do yourself. **Ans.** $\angle A = 60^\circ$, $\angle B = 80^\circ$, $\angle C = 100^\circ$ and $\angle D = 120^\circ$
11. Do yourself. **Ans.** Parallel, equal.

Multiple Choice Questions

Do yourself.

Revision Exercise

- 1.** Do yourself. **Ans.** 97°
2. Do yourself. **Ans.** $\angle P = 54^\circ$, $\angle Q = 72^\circ$, $\angle R = 108^\circ$ and $\angle S = 126^\circ$;
 $\angle P + \angle S = 54^\circ + 126^\circ = 180^\circ \Rightarrow PQ$ and SR are parallel to each other
 $\angle P + \angle Q = 54^\circ + 72^\circ = 126^\circ \neq 180^\circ \Rightarrow PS$ is not parallel to QR

- 3.** Measure of two angles in quadrilateral = 68° and 76°

Ratio between other two angles = $5 : 7$

Let other two angles are $5x$ and $7x$

$$\text{Then, } 68^\circ + 76^\circ + 5x + 7x = 360^\circ$$

$$144^\circ + 12x = 360^\circ$$

$$12x = 360^\circ - 144^\circ = 216^\circ$$

$$x = \frac{216}{12} = 18$$

$$\text{So, other two angles} = 5x = 5 \times 18 = \mathbf{90^\circ}$$

$$\text{and } = 7x = 7 \times 18 = \mathbf{126^\circ}$$

Thus, other two angles are 90° and 126° .

- 4.** Do yourself. **Ans.** (i) $x = 16^\circ$ (ii) 64° , 90° , 92° and 114°

- 5.** Measure of two angles of a quadrilateral = 89° and 113°

Given that other two angles are equal

$$\text{Let the other angle} = x^\circ$$

Then, the sum of all the angles of quadrilateral = 360°

$$89^\circ + 113^\circ + x^\circ + x^\circ = 360^\circ$$

$$202^\circ + 2x^\circ = 360^\circ$$

$$2x^\circ = 360^\circ - 202^\circ = 158^\circ$$

$$x^\circ = \frac{158^\circ}{2} = \mathbf{79^\circ}$$

Thus, equal angles measure is 79° each.

6. Measure of two opposite angles of a parallelogram = 100° each
 Since adjacent angles of a parallelogram are supplementary

Therefore,

$$\angle A + \angle B = 180^\circ$$

$$100^\circ + \angle B = 180^\circ$$

$$\angle B = 180^\circ - 100^\circ = 80^\circ$$

Since opposite angles of a parallelogram

So,

$$\angle B = \angle D = 80^\circ$$

Thus, measure of other two angles is 80° each.

7. Do yourself. **Ans.** (i) $\angle B = 90^\circ$ (ii) rectangle
 8. Do yourself. **Ans.** Each angle is 90° , So quadrilateral is a rectangle
 9. Do yourself. **Ans.** All the sides must be equal and angle is 90°
 10. In a trapezium

Given

$$\angle A = x^\circ, \angle D = (3x - 20)^\circ$$

$\therefore AB \parallel DC$ and DA is transversal

$\therefore \angle A$ and $\angle D$ are co-interior angles with their sum = 180°

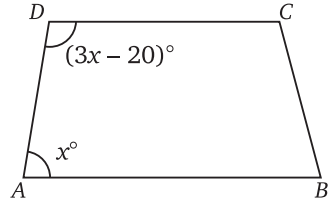
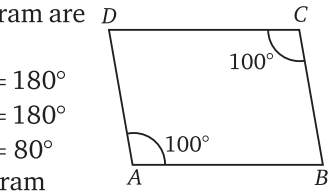
$$\text{i.e., } \angle A + \angle D = 180^\circ$$

$$x^\circ + (3x - 20)^\circ = 180^\circ$$

$$4x^\circ - 20^\circ = 180^\circ$$

$$4x^\circ = 180^\circ + 20^\circ = 200^\circ$$

$$x^\circ = \frac{200^\circ}{4} = 50^\circ$$



Then, measure of x is 50° .

11. Measure of two diagonals of an isosceles trapezium = x and $(3x - 8)$ cm

We know that for isosceles trapezium both diagonals will equal

So,

$$x = 3x - 8$$

\Rightarrow

$$3x - x = 8$$

\Rightarrow

$$2x = 8$$

\Rightarrow

$$x = \frac{8}{2} = 4$$

Thus, value of x is 4.

16.

Constructions

Exercise 16A-16B

Do yourself.

Exercise 16C

1. (i) on the circle (ii) the centre, on the circle (iii) passes through the (iv) an arc
 2. Do yourself.
 Here the figure $ABCD$ is a square.

3. Diameter = 12 cm

$$\therefore \text{Radius} = \frac{\text{Diameter}}{2} = \frac{12}{2} = \mathbf{6 \text{ cm}}$$

4. Radius = 5 cm

$$\therefore \text{Radius} = \frac{\text{Diameter}}{2}$$

$$\text{Diameter} = 2 \times \text{Radius} = 2 \times 5 \text{ cm} = \mathbf{10 \text{ cm}}$$

5. **6., 7., 8.** Do yourself.

9. Do yourself.

Yes, the perpendicular bisector of AB passes through the centre of the circle.

10. Do yourself.

Yes, the perpendicular bisector of the line segment PQ passes through the centre of the circle.

Exercise 16D

1. Do yourself. Yes, the lines l and m are parallel to each other.
2. Do yourself. **3.** Do yourself.
4. Do yourself. Yes, AE and EC are equal.
5. Do yourself.

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to **8.;** Do yourself.
9. Do yourself. Yes, all the points of the line segment $P_1 P_2$ lie in the interior of the circle.
10. Do yourself.
Yes, the point P lie in the interior of the circle with radius 4 cm.

17.

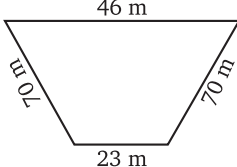
Perimeter and Area

Exercise 17A

1. (i) Perimeter of triangle = Sum of three sides
 $= (3 + 1.5 + 2) \text{ cm} = \mathbf{6.5 \text{ cm}}$

(ii), (iii) Do yourself.

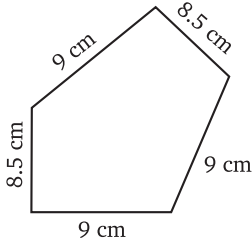
(iv) $10 \text{ cm} + 10 \text{ cm} + 10 \text{ cm} = \mathbf{30 \text{ cm}}$

2. (i) 

$$= (46 + 23 + 70 + 70) \text{ m} = \mathbf{209 \text{ m}}$$

(ii), (iii) Proceed as above.

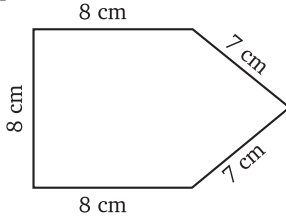
3. (i)



$$= (9 + 9 + 9 + 8.5 + 8.5) \text{ cm} = \mathbf{44 \text{ cm}}$$

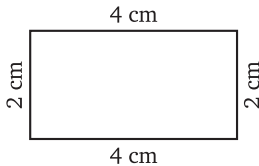
(ii) proceed as above.

(iii)



$$= (8 + 8 + 8 + 7 + 7) \text{ cm} = \mathbf{38 \text{ cm}}$$

4. (i)



Perimeter of rectangle = Sum of four side

$$= (4 + 4 + 2 + 2) \text{ cm} = \mathbf{12 \text{ cm}}$$

(ii), (iii) Proceed as above.

5. (i) Perimeter of square = $4 \times \text{side} = 4 \times 4 \text{ m} = \mathbf{16 \text{ m}}$

(ii), (iii) Do yourself.

6. (i) Perimeter of rectangle = Sum of four sides

$$= (4 + 3.5 + 4 + 3.5) \text{ cm} = \mathbf{15 \text{ cm}}$$

(ii) Do yourself.

(iii) Perimeter of rectangle = Sum of four sides

$$= (0.2 \text{ m} + 15 \text{ cm} + 0.2 \text{ m} + 15 \text{ cm}) \\ = \mathbf{70 \text{ cm}}$$

7. (i) Perimeter of rectangle = $2 \times (l + b)$

$$= 2 \times (5 + 4) = 2 \times 9 = 18 \text{ cm}$$

(ii) Do yourself.

(iii) $2 \times (l + b) = 2 \times (7 + 1.5) = 2 \times 8.5 = \mathbf{17 \text{ cm}}$

8. (i) Perimeter of square = 4 side

$$100 = 4 \times \text{side} \Rightarrow \frac{100}{4} = \text{side}$$

$$\text{side} = \mathbf{25 \text{ cm}}$$

(ii), (iii), (iv) Do yourself.

9. Perimeter of triangle = Sum of three sides.

$$50 = 15 + 20 + x \Rightarrow 50 - 35 = x$$

$$\Rightarrow x = 50 - 35 = 15$$

Third side = **15 cm**

10. (i) Perimeter of rectangle = 360 cm
 Length of rectangle = 100 cm
 Perimeter of rectangle = $2(l + b)$
 $360 = 2(100 + b)$
 $100 + b = \frac{360}{2} = 180$
 $b = 180 - 100 = \mathbf{80\text{ cm}}$

(ii), (iii) Do yourself.

- (iv) Perimeter of rectangle = 360 cm
 Length of rectangle = 102 cm
 Perimeter of rectangle = $2(l + b)$
 $360 = 2(102 + b)$
 $102 + b = \frac{360}{2} = 180$
 $b = 180 - 102 = \mathbf{78\text{ cm}}$

11. Perimeter of rectangular park = $2 \times (l + b)$
 $= 2 \times (300 + 200) = 1000\text{ m}$
 \therefore Cost of fencing a park = ₹ 1000 × 24 = ₹ **24000**

12. Distance covered by Megha = $4 \times 75\text{ m} = 300\text{ m}$
 Distance covered by Riya = $2 \times (60 + 45)\text{ m} = 2 \times 105\text{ m} = 210\text{ m}$
 Since **300 > 210**

\therefore Riya covered smaller distance.

13. Side of a square park = 300 m
 Perimeter of square park = $4 \times \text{side} = 4 \times 300 = 1200\text{ m}$
 \therefore Cost of fencing of square park = ₹ 20 × 1200 = ₹ **24000**
 Thus, cost of fencing is ₹ 24000.

14. Perimeter of square = $4 \times \text{side} = 4 \times 75 = 300\text{ m}$
 Distance covered in three times by Parul = $300 \times 3 = \mathbf{900\text{ m}}$
 Perimeter of rectangle = $2 \times (l + b) = 2 \times (160 + 105)$
 $= 2 \times 265 = 530\text{ m}$
 Distance covered in two times by Aman = $2 \times 530 = \mathbf{1060\text{ m}}$
 Aman covers more distance = $1060\text{ m} - 900\text{ m} = \mathbf{160\text{ m}}$.
 Thus, Aman covers 160 m more distance by Parul.

Exercise 17B

1. (i) Area of rectangle = length × breadth = $4\text{ cm} \times 1\text{ cm} = \mathbf{4\text{ cm}^2}$
 (ii), (iii) Do yourself.
2. (i) Area of rectangle = length × breadth
 $= 24\text{ cm} \times 10\text{ cm} = \mathbf{240\text{ cm}^2}$
 (ii), (iii), (iv) Do yourself.
3. (i) Area of rectangle = length × breadth
 $= 11\text{ cm} \times 7\text{ cm} = \mathbf{77\text{ cm}^2}$
 (ii) Do yourself.

4. (i) Area of square = (side)² = (11)² = **121 cm²**
(ii) Do yourself.
5. (i) Area of rectangle = $l \times b = 24 \times 16 = 384 \text{ cm}^2$
(ii) Area of square = (Side)² = (21)² = 441 cm²
Square has larger area = 441 – 384 = **57 cm²**
6. (i) Area of rectangle = length \times breadth
= $2l \times b = \mathbf{2lb}$ (**doubled**)
(ii) $l \times b = lb = 1 \times 2b = \mathbf{2lb}$ (**doubled**)
(iii) $l \times b = 2l \times 2b = \mathbf{4lb}$ (**four times**)
7. (i) Area of square = (side)² = (2x)² = **4x²**
Area will get four times than original area.
(ii) Area of square = (3x)² = **9x²**
Area will get nine times than original area.
(iii) Area of square = $\left(\frac{1}{2}x\right)^2 = \frac{1}{4}x^2$
8. 1 cm = 10 mm, 1 cm² = 1 cm \times 1 cm = 10 mm \times 10 mm
= **100 mm²**
9. 1 m = 100cm, 1 m² = 1 m \times 1 m = 100cm \times 100 cm = **10000 cm²**
10. Area of square = Area of rectangle = 16² = 64 \times breadth
 \therefore breadth = $\frac{16 \times 16}{64} = \frac{16}{4} = \mathbf{4 \text{ cm}}$

Multiple Choice Questions

Do yourself.

Revision Exercise

1. to 4.; Do yourself.
4. Side of square field = 70 m
Perimeter of square field = 4 \times side = 4 \times 70 = 280 m
Length of rectangular field = 50 m
Breadth of rectangular field = 40 m
Perimeter of rectangular park = 2(l + b) = 2(50 + 40) = 180 m
280 m > 180 m
Difference of perimeter = 280 m – 180 m = **100 m**
Thus, perimeter of squared field is 100 m more than rectangular field.
5. Side of regular pentagon = 12 cm
Perimeter of regular pentagon = 5 \times side = 5 \times 12 = 60 cm
Since perimeter of regular pentagon and hexagon are same,
Therefore, side of hexagon = $\frac{\text{Perimeter of Hexagon}}{6} = \frac{60}{6} = \mathbf{10 \text{ cm}}$
Thus, side of the hexagon is 10 cm.
6. Side of a square = 45 cm
Perimeter of square = 4 \times side = 4 \times 45 = 180 cm

Length of the rectangle = 50 cm
 Perimeter of rectangle = Perimeter of square
 Perimeter of rectangle = $2(l + b)$

$$180 = 2(50 + b) \Rightarrow 50 + b = \frac{180}{2} = 90$$

$$b = 90 - 50 = \mathbf{40 \text{ cm}}$$

Thus, breadth of the rectangle is 40 cm.

7. (i) Side of the square = 7.2 cm
 Area of the square = $(\text{side})^2 = (7.2)^2 = \mathbf{51.84 \text{ cm}^2}$

Thus, area of the square is 51.84 cm².

- (ii) Side of the square = 4.5 m
 Area of the square = $(\text{side})^2 = (4.5)^2 = \mathbf{20.25 \text{ m}^2}$

Thus, area of the square is 20.25 m².

- (iii) Side of the square = 4.1 cm
 Area of the square = $(\text{side})^2 = (4.1)^2 = \mathbf{16.81 \text{ cm}^2}$

Thus, area of the square is 16.81 cm².

8. Side of a square = 7 m
 Area of square = $(\text{side})^2 = (7)^2 = 49 \text{ m}^2$

After increasing by 3 m side of square
 $= (7 + 3) \text{ m} = 10 \text{ m}$

$$\text{Area of square} = (\text{side})^2 = (10)^2 = 100 \text{ m}^2$$

$$\text{Increase in area} = 100 \text{ m}^2 - 49 \text{ m}^2 = \mathbf{51 \text{ m}^2}$$

Thus, 51 m² area increases.

9. Do yourself. **Ans.** 4 unit

10. Area of rectangular piece of paper = 24 cm²

Length of rectangular piece of paper = 5 cm

$$\text{Area of rectangle} = l \times b$$

$$24 = 5 \times b = \frac{24}{5} = 4.8 \text{ cm}$$

Now perimeter of rectangular piece of paper = $2(l + b)$
 $= 2(5 + 4.8) = \mathbf{19.6 \text{ cm}}$

Thus, perimeter of rectangular piece of paper is 19.6 cm.

11. Do yourself. **Ans.** 204 m

12. Length of a rectangle = 30 m

Breadth of a rectangle = 20 m

$$\text{Area of rectangle} = l \times b = 30 \times 20 = 600 \text{ m}^2$$

Increased length of rectangle = 30 + 10 = 40 m

Increased breadth of rectangle = 20 × 2 = 40 m

Now, area of rectangle = $l \times b = 40 \times 40 = 1600 \text{ m}^2$

$$\text{Increase in area} = 1600 \text{ m}^2 - 600 \text{ m}^2 = \mathbf{1000 \text{ m}^2}$$

Thus, area increased by 1000 m².

18.

Data Handling

Do yourself.