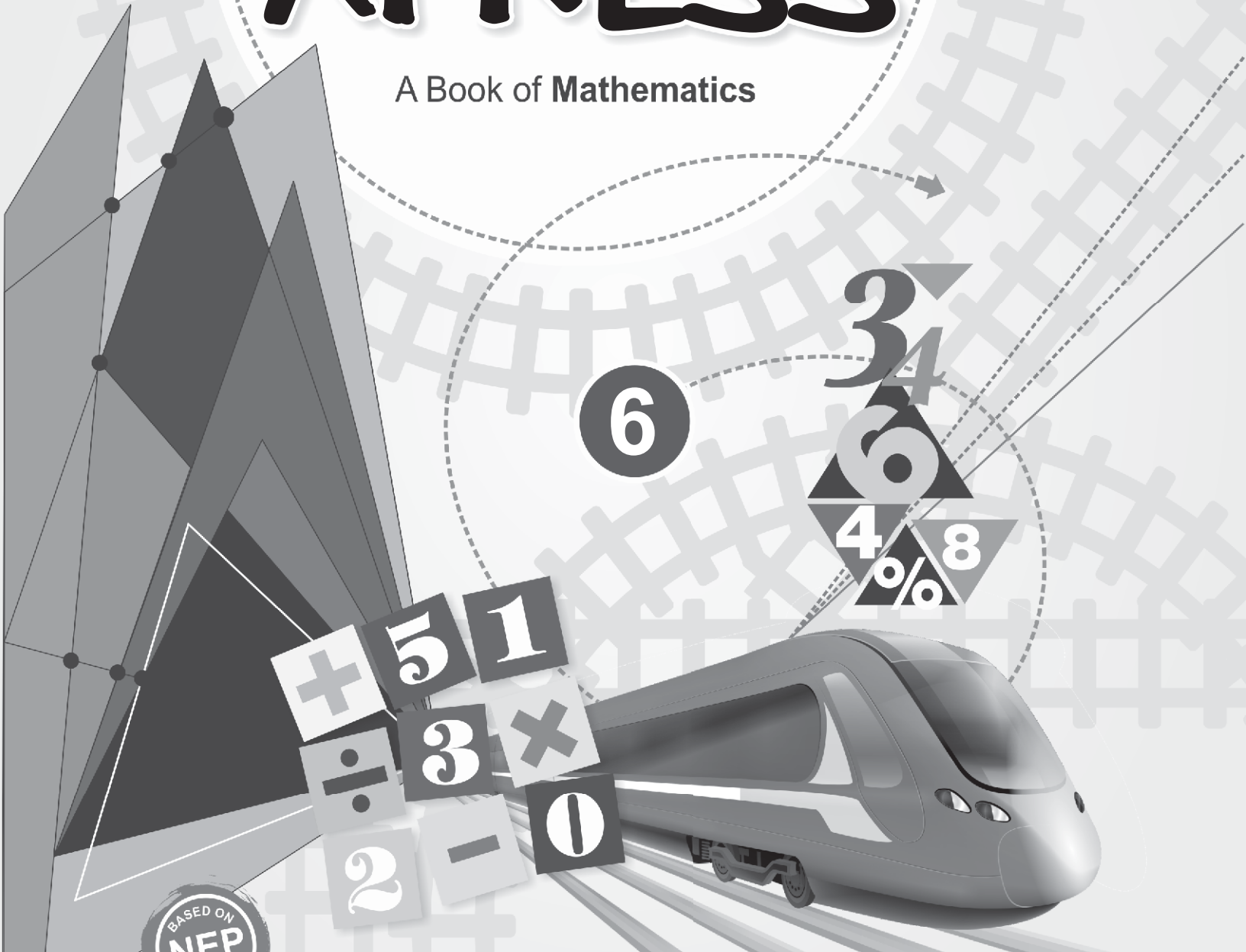




MATHS XPRESS

A Book of Mathematics



1. Knowing Our Numbers

Exercise 1.1

- 1.** 11,000; 11,001; 11,002 **2.** 10,000; 9,999; 9,998
3. 0 **4.** 20
5. (i) F (ii) F (iii) T (iv) T
(v) T (vi) F (vii) F (viii) F
(ix) T (x) F (xi) F (xii) T (xiii) F
6. (i) 10000, 9999 (ii) 99999, 100000
(iii) largest (iv) six (v) 10000, 99999
7. (i) Thirty-four lakh twenty-eight thousand nine hundred fifty-seven (ii) Six crore two lakh eighty-five thousand four hundred thirty-one (iii) Nine crore twenty-seven lakh thirty-two thousand eight hundred fifty-six (iv) Fifty crore twenty-eight lakh ninety-six thousand three hundred twenty-seven
8. (i) 5000 (ii) 1000000 (iii) 0 (iv) 900
9. (i) 8 (ii) 4 (iii) 6 (iv) 3
10. (i) Three million nine hundred twenty-six thousand four hundred fifty-two (ii) Ten million two hundred eighty-nine thousand one hundred sixty-four (iii) Fifty-two million eight hundred nineteen thousand six hundred seventy-two (iv) Four hundred twenty-three million two hundred eighty-one thousand sixty-nine
11. (i) $3000000 + 20000 + 8000 + 500 + 10 + 6$
(ii) $70000000 + 1000000 + 300000 + 90000 + 6000 + 200 + 80 + 1$
(iii) $50000000 + 1000000 + 200000 + 80000 + 9000 + 100 + 60 + 3$
(iv) $400000000 + 10000000 + 3000000 + 700000 + 20000 + 8000 + 900 + 10 + 6$
12. (i) 35878967 (ii) 80765965 (iii) 906074894 (iv) 37598448
13. (i) Seven lakh twenty-six thousand nine hundred thirty-four (ii) Six crore thirty-two lakh eleven thousand thirty-six
14. (i) One million six hundred thirty-five thousand fifteen (ii) Ninety one million five hundred thousand seven hundred fifty-six.

Exercise 1.2

- 1.** (i) < (ii) > (iii) > (iv) <
(v) > (vi) < (vii) < (viii) >
(ix) >
2. (i) < (ii) > (iii) < (iv) >
3. (i) 91632814, 63912804, 40281963, 7128543
(ii) 83791632, 37289164, 14096328, 8140324
(iii) 57398264, 57289163, 53296324, 6728963
(iv) 97283761, 72362051, 40281963, 3720916

4. (i) 2139176, 3289163, 37896432, 42810632
 (ii) 1672849, 4378963, 5137284, 5139785
 (iii) 32916345, 40296374, 81409632, 89632451
 (iv) 3854963, 37289642, 72896324, 81403729
5. (i) smallest 84, greatest 5942
 (ii) smallest 5499, greatest 54909
6. (i) greatest 9874320, smallest 2034789
 (ii) greatest 9765321, smallest 1235679
 (iii) greatest 98743210, smallest 10234789
 (iv) greatest 97654321, smallest 12345679
7. (i) 98273496, 98273498
 (ii) 72373, 72375
 (iii) 7354526, 7354528
 (iv) 173899, 173901
 (v) 99999, 100001

Word Problems

1. 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.
2. 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.
3. 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.
4. 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.
5. 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 = $(254 \text{ m } 25 \text{ cm}) \div 15$
= **16 m 95 cm** or **1695 cm**

Thus, the length of ribbon that each one will get is 16 m 95 cm.

And in cm = 1695 cm

6. The perimeter of park = 475 m 50 cm or 47550 cm

Distance will cover in 5 rounds = $47550 \text{ cm} \times 5$

= **237750 cm** or **2377 m 50 cm**

Thus, man walks 237750 cm or 2377 m 50 cm.

7. Total amount of sugar shopkeeper had = 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

= $3200 \text{ L } 208 \text{ mL} - 2486 \text{ L } 196 \text{ mL}$

= **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 = $47865 \text{ L } 360 \text{ mL} - 23912 \text{ L } 125 \text{ mL}$

= **23953 L 235 mL**

Thus, 23953 L 235 mL water left in the tank.

Revision Exercise

- (i) F (ii) T (iii) F (iv) T (v) F
- (i) (a) One lakh sixty three thousand four hundred sixty two
(b) Twenty seven lakh fourteen thousand six hundred fifty (c) One crore twenty seven lakh ninety one thousand four hundred fifty eight
(ii) (a) One hundred sixty three thousand four hundred sixty two
(b) Two million seven hundred fourteen thousand six hundred fifty.
(c) Twelve million seven hundred ninety one thousand four hundred fifty eight.
- 33, 32, 22,111 : Thirty three crore thirty two lakh twenty two thousand one hundred eleven
- Difference between the place value and face value of 5 = $5000 - 5 = 4995$
- (i) (d), (ii) (c), (iii) (a), (iv) (b)

6. (i) Three million nine hundred fifty-four thousand nine hundred sixty-four
 (ii) Seventy million four hundred ninety-one thousand seventy-five
 (iii) Four hundred thirty-three million seven hundred eighty-five thousand seven hundred fifty-four
 (iv) Seven hundred ninety-four million four hundred three thousand fifty-nine.

7. Stock of wheat bags = 35967840
 Stock of rice bags = 28535960
 Stock of bajra bags = 18368540

$$\begin{aligned} \text{Total number of bags in godown} &= 35967840 + 28535960 + 18368540 \\ &= \mathbf{82872340} \end{aligned}$$

8. Amount of money Mohit has = ₹ 5385980

$$\text{Cost of house} = ₹ 3876560$$

$$\text{Cost of car} = ₹ 539849$$

$$\begin{aligned} \text{Total money he spent} &= ₹ 3876560 + ₹ 539849 \\ &= ₹ 4416409 \end{aligned}$$

$$\begin{aligned} \text{Amount of money left with him} &= ₹ 5385980 - ₹ 4416409 \\ &= ₹ \mathbf{969571} \end{aligned}$$

Thus, ₹ 969571 is left with him.

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

$$\text{Carrying capacity of truck} = 6018 \text{ kg}$$

Number of boxes can be loaded in truck

$$\begin{aligned} &= \frac{\text{Carrying capacity of truck}}{\text{Weight of one box}} \\ &= \frac{6018}{25.500} = \mathbf{236 \text{ boxes}} \end{aligned}$$

Thus, truck can carry 236 boxes.

10. Production of screws in one day = 4826

$$\text{Number of Holidays in 2020 year} = 65$$

$$\begin{aligned} \text{Number of working days} &= 366 - 65 (\because 2020 \text{ is leap year}) \\ &= 301 \text{ days} \end{aligned}$$

$$\text{Production of screws in 301 days} = 4826 \times 301$$

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

Thus, 1452626 screws will produce in year 2020.



2. Playing with Numbers

Exercise 2.1

1. (i) Factors of 50
 $50 = 1 \times 50 = 2 \times 25 = 5 \times 10$
 $= 1, 2, 5, 10, 25, 50$
- (ii) Factors of 84
 $84 = 1 \times 84 = 2 \times 42 = 3 \times 28$
 $= 4 \times 21 = 6 \times 14 = 7 \times 12$
 $= 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84$
- (iii) Factors of 76 = $1 \times 76 = 2 \times 38 = 4 \times 19 = 1, 2, 4, 19, 38, 76$
- (iv) Factors of 89
 $89 = 1 \times 89 = 1, 89$
- (v) Factors of 125
 $125 = 1 \times 125 = 5 \times 25$
 $125 = 1, 5, 25, 125$
- (vi) Factors of 144
 $144 = 1 \times 144 = 2 \times 72 = 3 \times 48 = 4 \times 36$
 $= 6 \times 24 = 8 \times 18 = 9 \times 16 = 12 \times 12$
 $144 = 1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144$
- (vii) Do yourself.
- (viii) Factors of 243
 $243 = 1 \times 243 = 3 \times 81 = 9 \times 27$
 $= 1, 3, 9, 27, 81, 243$
2. (ii) and (iii)
3. (i) No (ii) 4, 9, 25, 49
4. (i) First five multiples of 15
 $15 \times 1 = 15, 15 \times 2 = 30, 15 \times 3 = 45, 15 \times 4 = 60, 15 \times 5 = 75$
Thus, 15, 30, 45, 60, 75 are first five multiples of 15.
- (ii) 17, 34, 51, 68, 85
- (iii) 19, 38, 57, 76, 95
- (iv) 35, 70, 105, 140, 175
- (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. (i) 16) 5728 (358

$$\begin{array}{r} \underline{48} \\ 92 \\ \underline{80} \\ 128 \\ \underline{128} \\ \times \end{array}$$

5728 is a multiple of 16.

(iii) 23) 15120 (657

$$\begin{array}{r} \underline{138} \\ 132 \\ \underline{115} \\ 170 \\ \underline{161} \\ 9 \end{array}$$

15120 is not a multiple of 23.

(ii) 23) 10558 (459

$$\begin{array}{r} \underline{92} \\ 135 \\ \underline{115} \\ 208 \\ \underline{207} \\ \underline{1} \end{array}$$

10558 is not a multiple of 23.

(iv) 43) 15824 (368

$$\begin{array}{r} \underline{129} \\ 292 \\ \underline{258} \\ 344 \\ \underline{344} \\ 0 \end{array}$$

15824 is a not multiple of 43.

6. (i) 12 = 48, 60, 72, 84, 96

(ii) 19 = 57, 76, 95

(iii) 25 = 50, 75

(iv) 32 = 64, 96

7. (i) 23, (iii) 31, (v) 109

8. (i) 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43

(ii) 3, 5, 7, 11, 13, 17, 19, 23, 29, 31

(iii) 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

(iv) 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53

9. Only one, 2

10. (i) 3 + 5 + 23 (ii) 3 + 5 + 43 (iii) 3 + 5 + 51 (iv) 3 + 5 + 69

(v) 3 + 5 + 97

11. (ii) (9, 10) (iii) (17, 24)

12. (iii) (17, 19)

13. (i) odd (ii) even (iii) even (iv) odd

14. The digit in the units place of a number is 5.

So, the number is multiple of 5.

If the number lies between 150 and 200, then it will be a composite number.

15. Smallest prime number between 10 and 50 = 11

Greatest prime number between 10 and 50 = 47

Sum of smallest and greatest prime number between 10 and 50

$$= 11 + 47 = 58$$

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

16. (i) F

(ii) T

(iii) F

(iv) T

(v) T

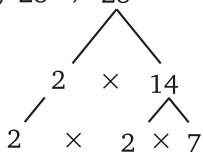
Exercise 2.2

1. (i) 34680 is divisible by 2, 4 and 8.
(ii) 13281 is not divisible by 2, 4 and 8.
(iii) 41064 is divisible by 2, 4 and 8.
(iv) 92312 is divisible by 2, 4 and 8.
(v) 609284 is divisible by 2 and 4 but not by 8.
(vi) 506322 is divisible by 2 but not divisible by 4 and 8.
(vii) 159632 is divisible by 2, 4 and 8.
(viii) 11645 is not divisible by 2, 4 and 8.
2. (i) Unit digit of the number 57280 is 0, So number is divisible by 5 and 10.
(ii) 63412, Unit digit = 2
It is not divisible by 5 and 10.
(iii) 91634, Unit digit = 4
It is not divisible by 5 and 10.
(iv) 81505, Unit digit = 5
It is divisible by 5 but not by 10.
(v) 672893, Unit digit = 3
It is not divisible by 5 and 10.
(vi) 704820, Unit digit = 0
It is divisible by 5 and 10.
(vii) 128945, Unit digit = 5
It is divisible by 5 but not by 10.
(viii) 672800, Unit digit = 0
It is divisible by 5 and 10.
3. (i) 63728 Sum of its digit $6 + 3 + 7 + 2 + 8 = 26$
Which is not divisible by 3, 6 and 9.
(ii) 5688, Sum of its digit $= 5 + 6 + 8 + 8 = 27$
Which is divisible by 3, 6 and 9.
(iii) 3408, Sum of its digit $= 3 + 4 + 0 + 8 = 15$
Which is divisible by 3 and 6 but not by 9.
(iv) 60928, Sum of its digit $= 6 + 0 + 9 + 2 + 8 = 25$
Which is not divisible by 3, 6 and 9.
(v) 11376, Sum of its digit $= 1 + 1 + 3 + 7 + 6 = 18$
Which is divisible by 3, 6 and 9.
(vi) 34128, Sum of its digit $= 3 + 4 + 1 + 2 + 8 = 18$
Which is divisible by 3, 6 and 9.

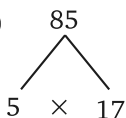
- (vii) 192948, Sum of its digit = $1 + 9 + 2 + 9 + 4 + 8 = 33$
Which is divisible by 3 and 6 but not by 9.
- (viii) 54282, Sum of its digit = $5 + 4 + 2 + 8 + 2 = 21$
Which is divisible by 3 and 6 but not by 9.
4. (i) $25578 \Rightarrow 2557 - (2 \times 8) = 2557 - 16 = 2541$
 $254 - (2 \times 1) = 252 \Rightarrow 25 - (2 \times 2) = 21$
Since, 21 is divisible by 7, so 25578 is also divisible by 7.
- (ii), (iii), (iv) (v), (vi), (vii) Do yourself.
- (viii) $1534680 \Rightarrow 153468 - 2 \times 0 = 153468$
 $15346 - 2 \times 8 = 15330$
 $1533 - 2 \times 0 = 1533$
 $153 - 2 \times 3 = 147$
Since, 147 is divisible by 7, so 1534680 is also divisible by 7.
5. (i) 7150
Sum of its digits at odd places from the right side = $0 + 1 = 1$
Sum of its digits at even places from the right side = $5 + 7 = 12$
Difference of the two sums = $12 - 1 = 11$,
Which is divisible by 11.
 \therefore 7150 is divisible by 11.
- (ii), (iii), (iv), (v), (vi), (vii)
- (viii) 429968
Sum of its digits at odd places from the right side
 $= 8 + 9 + 2 = 19$
Sum of its digits at even places from the right side
 $= 6 + 9 + 4 = 19$
Difference of the two sums = $19 - 19 = 0$
 \therefore 429968 is divisible by 11.
6. (i) $64k3 \Rightarrow 6 + 4 + k + 3 = 13 + k$
Here, if k is replaced by 2, then $13 + k$ is exactly divisible by 3.
Hence, $k = 2$
- (ii), (iii) Do yourself.
7. (i) $76k91 \Rightarrow 7 + 6 + k + 9 + 1 = 23 + k$
Here, if k is replaced by 4, then $23 + k$ is exactly divisible by 9.
Hence, $k = 4$
- (ii), (iii) Do yourself.
8. (i) $39k2$
Sum of its digits at odd places from the right side = $2 + 9 = 11$
Sum of its digits at even places from the right side = $k + 3$
Difference of the two sums = $k + 3 - 11 = k - 8$
Here, if k is replaced by 8, then $k - 8$ is exactly divisible by 11.
Hence, $k = 8$
- (ii), (iii), (iv) Do yourself.
9. (i) F (ii) T (iii) T (iv) T

Exercise 2.3

1. (i) $28 \Rightarrow 28 \Rightarrow$ We have $28 = 2 \times 2 \times 7$

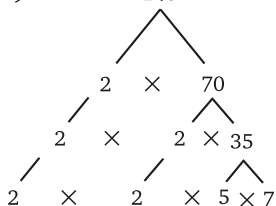


(ii), (iii) Do yourself (iv) $85 \Rightarrow$ We have $85 = 5 \times 17$



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

(viii) $140 \Rightarrow 140 \Rightarrow$ We have $140 = 2 \times 2 \times 5 \times 7$



2. (i) $240 \Rightarrow$

2	240	
2	120	
2	60	
2	30	
3	15	
5	5	
1		

\Rightarrow We have $240 = 2 \times 2 \times 2 \times 2 \times 3 \times 5$

(ii) $360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$

(iii) $420 = 2 \times 2 \times 3 \times 5 \times 7$

(iv) $576 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$

(v) $500 = 2 \times 2 \times 5 \times 5 \times 5$

(vi) $980 = 2 \times 2 \times 5 \times 7 \times 7$

(vii) $1024 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

(viii) $3125 = 5 \times 5 \times 5 \times 5 \times 5$

3. Smallest 5-digit number = 10000

$10000 = 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$

4. Largest 4-digit number = 9999

We have, $9999 = 3 \times 3 \times 11 \times 101$

5. $1729 = 7 \times 13 \times 19$

Difference between two consecutive factors is 6.

Exercise 2.4

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) For the HCF of 25 and 20

Factors of 25 = 5, 5

Factors of 20 = 2, 2, 5

Common factor of 25 and 20 is **5**.

Thus, 5 is the HCF of 25 and 20.

(iii) For the HCF of 27 and 75

Factors of 27 = **3**, 3, 3

Factors of 75 = **3**, 5, 5

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

Thus, 3 is the HCF of 27 and 75.

(iv) For the HCF of 8, 12 and 18

Factors of 8 = 2, 2, 2

Factors of 12 = 2, 2, 3

Factors of 18 = 2, 3, 3

Common factor of 8, 12 and 18 is **2**.

Thus, 2 is the HCF of 8, 12 and 18.

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

Factors of 24 = 2, 2, 2, **3**

Factors of 36 = 2, 2, **3**, 3

Factors of 45 = 3, **3**, 5

Factors of 60 = 2, 2, **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, **13**

Factors of 39 = 3, **13**

Factors of 273 = 3, 7, **13**

Common factor of 13, 39 and 273 is **13**.

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

2. (i) For the HCF of 5 and 8
 Prime factors of 5 = 5×1
 Prime factors of 8 = $2 \times 2 \times 2$
 There is no common factor of 5 and 8.
 So, HCF of 5 and 8 is 1.
- (ii) For the HCF of 24 and 49
 Prime factors of 24 = $2 \times 2 \times 2 \times 3$
 Prime factors of 49 = 7×7
 There is no common factor of 24 and 49.
 So, HCF of 24 and 49 is 1.
- (iii) For the HCF of 40, 60 and 80
 Prime factors of 40 = $2 \times 2 \times 2 \times 5$
 Factors of 60 = $2 \times 2 \times 3 \times 5$
 Prime factors of 80 = $2 \times 2 \times 2 \times 2 \times 5$
 Prime factors common to the given numbers are 2, 2, 5.
 HCF = $2 \times 2 \times 5 = 20$.
 Thus, HCF of 40, 60 and 80 is 20.
- (iv) For the HCF of 48, 84 and 88
 Prime factors of 48 = $2 \times 2 \times 2 \times 2 \times 3$
 Prime factors of 84 = $2 \times 2 \times 3 \times 7$
 Prime factors of 88 = $2 \times 2 \times 2 \times 11$
 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) For the HCF of 12, 16 and 28
 Prime factors of 12 = $2 \times 2 \times 3$
 Prime factors of 16 = $2 \times 2 \times 2 \times 2$
 Prime factors of 28 = $2 \times 2 \times 7$
 Prime factors common to the given numbers are 2, 2.
 HCF = $2 \times 2 = 4$
 Thus, HCF of 12, 16 and 28 is 4.
- (vi) For the HCF of 140, 150 and 210
 Prime factors of 140 = $2 \times 2 \times 5 \times 7$
 Prime factors of 150 = $2 \times 3 \times 5 \times 5$
 Prime factors of 210 = $2 \times 3 \times 5 \times 7$
 Prime factors common to the given numbers are 2, 5.
 HCF = $2 \times 5 = 10$
 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) For the HCF of 935 and 1320

$$\begin{array}{r}
 935 \overline{)1320} (1 \\
 \underline{935} \\
 385 \overline{)935} (2 \\
 \underline{770} \\
 165 \overline{)385} (2 \\
 \underline{330} \\
 55 \overline{)165} (3 \\
 \underline{165} \\
 \times
 \end{array}$$

Since the last divisor is 55.

Thus, HCF of 935 and 1320 is 55.

- (iii) For the HCF of 516, 1188 and 2148

$$\begin{array}{r}
 516 \overline{)1188} (2 \\
 \underline{1032} \\
 156 \overline{)516} (3 \\
 \underline{468} \\
 48 \overline{)156} (3 \\
 \underline{144} \\
 12 \overline{)48} (4 \\
 \underline{48} \\
 \times
 \end{array}$$

HCF of 516 and 1188 is 12.

Now, HCF of 12 and 2148

- 12) 2148 (179

$$\begin{array}{r}
 \underline{12} \\
 94 \\
 \underline{84} \\
 108 \\
 \underline{108} \\
 \times
 \end{array}$$

Thus, HCF of 516, 1188 and 2148 is 12.

(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.

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

Now HCF of 747 and 8217

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

4. (i) T (ii) T (iii) F (iv) T (v) F

Word Problems

- HCF of any two consecutive numbers is 1.
- Two nearest number = $65610 + 27 = 65637$, $65610 - 27 = \mathbf{65583}$

3. 850, 680

$$\begin{array}{r} 680 \overline{)850} \{1 \\ \underline{680} \\ 170 \overline{)680} \{4 \\ \underline{680} \\ \times \end{array}$$

HCF = **170**

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

4.

$$\begin{array}{r} 1343 - 9 = 1334 \\ 8593 - 9 = 8584 \\ 1334 \overline{)8584} \{6 \\ \underline{8004} \\ 580 \overline{)1334} \{2 \\ \underline{1160} \\ 174 \overline{)580} \{3 \\ \underline{522} \\ 58 \overline{)174} \{3 \\ \underline{174} \\ \times \end{array}$$

HCF = **58**

The largest number is 58.

- Length = 2 m 67 cm = 267 cm
Breadth = 4 m 45 cm = 445 cm
Height = 7 m 12 cm = 712 cm
HCF of 267, 445 and 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**.

6. HCF of 731 – 9, 1132 – 11 and 1822 – 17

HCF of 722, 1121 and 1805

$$\begin{array}{r}
 722 \overline{)1121} (1 \\
 \underline{722} \\
 399 \overline{)722} (1 \\
 \underline{399} \\
 323 \overline{)399} (1 \\
 \underline{323} \\
 76 \overline{)323} (4 \\
 \underline{304} \\
 19 \overline{)76} (4 \\
 \underline{76} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 19 \overline{)1805} (95 \\
 \underline{171} \\
 95 \\
 \underline{95} \\
 \times \\
 \text{HCF} = 19
 \end{array}$$

The largest numbers is 19.

Exercise 2.5

1. (i) 18, 77

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

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

$$\begin{array}{r|l}
 \text{(ii) } 15, 30, 90 & 2 \overline{)15, 30, 90} \\
 \hline
 3 \overline{)5, 15, 45} & \\
 \hline
 3 \overline{)5, 5, 15} & \\
 \hline
 5 \overline{)5, 5, 5} & \\
 \hline
 & 1, 1, 1
 \end{array}$$

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

$$\begin{array}{r|l}
 \text{(iii)} & 3 \overline{)45, 105, 165} \\
 \hline
 3 \overline{)15, 35, 55} & \\
 \hline
 5 \overline{)5, 35, 55} & \\
 \hline
 7 \overline{)1, 7, 11} & \\
 \hline
 11 \overline{)1, 1, 11} & \\
 \hline
 & 1, 1, 1
 \end{array}$$

$$\text{LCM} = 3 \times 3 \times 5 \times 7 \times 11 = 3465$$

(iv)

2	6, 15, 18, 30
3	3, 15, 9, 15
3	1, 5, 3, 5
5	1, 5, 1, 5
	1, 1, 1, 1

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

(v)

2	180, 384, 144
2	90, 192, 72
2	45, 96, 36
2	45, 48, 18
2	45, 24, 9
2	45, 12, 9
2	45, 6, 9
3	45, 3, 9
3	15, 1, 3
5	5, 1, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 5760$$

(vii)

2	108, 135, 162
2	54, 135, 81
3	27, 135, 81
3	9, 45, 27
3	3, 15, 9
3	1, 5, 3
5	1, 5, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5 = 1620$$

(vi)

2	150, 450, 550
3	75, 225, 275
3	25, 75, 275
5	25, 25, 275
5	5, 5, 55
11	1, 1, 11
	1, 1, 11

$$\begin{aligned} \text{LCM} &= 2 \times 3 \times 3 \times 5 \times 5 \times 5 \times 1 \\ &= 4950 \end{aligned}$$

(viii) 128, 216, 432

2	128, 216, 432
2	64, 108, 216
2	32, 54, 108
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

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

2. (i) $14 = 2 \times 7$

$$21 = 3 \times 7$$

$$\text{HCF} = 7$$

$$\text{LCM} = 2 \times 3 \times 7 = 42$$

$$\text{HCF} \times \text{LCM} = 7 \times 42 = 294$$

$$\text{Product of the number} = 14 \times 21 = 294$$

$$\text{HCF} \times \text{LCM} = \text{Product of the numbers}$$

(ii) $25 = 5 \times 5$

$$65 = 5 \times 13$$

$$\text{HCF} = 5$$

$$\text{LCM} = 5 \times 5 \times 13 = 325$$

$$\text{HCF} \times \text{LCM} = 5 \times 325 = 1625$$

$$\text{Product of the numbers} = 25 \times 65 = 1625$$

$$\text{HCF} \times \text{LCM} = \text{Product of the numbers}$$

(iii) $27 = 3 \times 3 \times 3$

$$90 = 2 \times 3 \times 3 \times 5$$

$$\text{HCF} = 3 \times 3 = 9$$

$$\text{LCM} = 3 \times 3 \times 2 \times 3 \times 5 = 270$$

$$\text{HCF} \times \text{LCM} = 9 \times 270 = 2430$$

$$\text{Product of the numbers} = 27 \times 90 = 2430$$

$$\text{HCF} \times \text{LCM} = \text{Product of the numbers}$$

(iv) $117 = 3 \times 3 \times 13$

$$221 = 13 \times 17$$

$$\text{HCF} = 13$$

$$\text{LCM} = 3 \times 3 \times 13 \times 17 = 1989$$

$$\text{HCF} \times \text{LCM} = 13 \times 1989 = 25857$$

$$\text{Product of the numbers} = 117 \times 221 = 25857$$

Word Problem

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

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

Hence, remainder is 9 then the required number

$$= 2800 + 9 = \mathbf{2809}$$

2. HCF of $9028 - 3$ and $9728 - 3$

HCF of 9025 and 9725.

$$\begin{array}{r}
 9025 \quad 9725 \quad (1) \\
 \underline{9025} \\
 700 \quad 9025 \quad (12) \\
 \underline{700} \\
 2025 \\
 \underline{1400} \\
 625 \quad 700 \quad (1) \\
 \underline{625} \\
 75 \quad 625 \quad (8) \\
 \underline{600} \\
 25 \quad 75 \quad (3) \\
 \underline{75} \\
 \times
 \end{array}$$

Required number = **25**

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

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

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

4.	2	40, 48, 56
	2	20, 24, 28
	2	10, 12, 14

2	5, 6, 7
3	5, 3, 7
5	5, 1, 7
7	1, 1, 7
	1, 1, 1

LCM of 40, 48 and 56

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 7 = 1680$$

$$\text{Required number} = 1680 + 5 = \mathbf{1685}$$

5. No.

$$\mathbf{6.} \quad \text{I number} \times \text{II number} = \text{LCM} \times \text{HCF}$$

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

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

Thus, 144 is the HCF of 576 and 720.

7. HCF of 180 m and 155 m

$$\begin{array}{r} 155 \overline{) 180} \quad (1 \\ \underline{155} \\ 25 \quad (6 \\ \underline{150} \\ 5 \quad (5 \\ \underline{25} \\ \times \end{array}$$

Length of a tape is **5m**.

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

HCF of 1792, 2632 and 3864

$$\begin{array}{r|l} 2 & 1792, 2632, 3864 \\ \hline 2 & 896, 1316, 1932 \\ \hline 2 & 448, 658, 966 \\ \hline 7 & 224, 329, 483 \\ \hline & 32, 47, 69 \end{array}$$

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

Thus, 56 is the required number.

9. $\text{HCF} \times \text{LCM} = \text{I number} \times \text{II number}$.

$$6 \times 3996 = 54 \times \text{II number}$$

$$\text{II number} = \frac{6 \times 3996}{54} = 444$$

10. No, because HCF must be a factor of LCM.

- 11.** 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

$$\text{HCF} = 2 \times 5 \times 5 = \mathbf{50 \text{ cm}}$$

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

- 12.** 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.

- 13.**

2	8, 15, 21
2	4, 15, 21
2	2, 15, 21
3	1, 15, 21
5	1, 5, 7
7	1, 1, 7
	1, 1, 1

$$\begin{aligned} \text{LCM of 8, 15 and 21} &= 2 \times 2 \times 2 \times 3 \times 5 \times 7 \\ &= 840 \end{aligned}$$

Now above 100000 it is **100800** which is exactly divide by 8, 15 and 21.

- 14.**

2	102, 136, 170
2	51, 68, 85
2	51, 34, 85
3	51, 17, 85
5	17, 17, 85
17	17, 17, 17
	1, 1, 1

$$\begin{aligned} \text{LCM of 102, 136 and 170} &= 2 \times 2 \times 2 \times 3 \times 5 \times 17 \\ &= 2040 \end{aligned}$$

$$\text{Required number} = 2040 + 8 = \mathbf{2048}$$

Revision Exercise

1. (i) $19 = 1, 19$
(ii) $60 = 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60$,
(iii) $29 = 1, 29$
(iv) $32 = 1, 2, 4, 8, 16, 32$
2. (i) Factors of $96 = 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96$
8 is a factors of 96.
(ii) Factors of $135 = 1, 3, 5, 9, 15, 27, 45, 135$
15 is a factor of 135.
(iii) Factors of $105 = 1, 3, 5, 7, 15, 21, 35, 105$
13 is not factor of 105.
(iv) Factors of $171 = 1, 3, 9, 19, 57, 171$
19 is a factor of 171.
3. (i) $34 = 3 + 31$ (ii) $40 = 3 + 37$
(iii) $56 = 3 + 53$ (iv) $80 = 7 + 73$
(v) $100 = 3 + 97$
4. (i) 11, 13, 17, 19, 23, 29 (ii) 37, 41, 43, 47, 53, 59
(iii) 61, 67, 71, 73, 79 (iv) 83, 89, 97
5. (i) 352, unit digit is 2 (even), so 352 is divisible by 2.
(ii) 523, unit digit is 3 (odd), so 523 is not divisible by 2.
(iii) 496, unit digit is 6 (even), so 496 is divisible by 2.
(iv) 649, unit digit is 9 (odd), so 649 is not divisible by 2.
6. (i) 5080, unit digit is 0, so 5080 is divisible by 5.
(ii) 66666, unit digit is 6, so 66666 is not divisible by 5.
(iii) 755, unit digit is 5, so 755 is divisible by 5.
(iv) 9207, unit digit is 7, so 9207 is not divisible by 5.
7. (i) $48 = 2 \times 2 \times 2 \times 2 \times 3$
(ii) $34 = 2 \times 17$
(iii) $98 = 2 \times 7 \times 7$
(iv) $216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$
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.

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

Thus, 480 is the LCM.

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

Thus, 6 is the HCF.



3. Integers

Exercise 3.1

1. (i) greater (ii) left (iii) right
(iv) less, greater (v) greater, less (vi) greater, less
(vii) less, greater (viii) greater, less
2. (i) - ₹ 380 (ii) + ₹ 860 (iii) + ₹ 1380
(iv) - 38 km (v) - ₹ 2360 (vi) - 25°C
(vii) + 28 runs (viii) + ₹ 150 (ix) + 24 km
3. (i) Increase in weight (ii) 48 km North
(iii) Profit of ₹ 850 (iv) 2100 m below sea-level
(v) Fall of ₹ 160 in cost (vi) 246 AD
(vii) Loss of ₹ 980 (viii) Withdrawal of ₹ 8650
(ix) Rise in price by ₹ 80
4. (i) $|-28| + 16 - |37| = 28 + 16 - 37 = 7$
(ii) $|-23 - 12| + |-18 + 6| = 35 + 12 = 47$
(iii) $|-41 - 29| - |-38 - 28| = 70 - 66 = 4$
(iv) $|-19| + |-28| + |-63| = 19 + 28 + 63 = 110$
5. (i) -15 (ii) 15 (iii) 8 (iv) 0
6. (i) -6 (ii) -3 (iii) -51 (iv) 0
7. (i) 7 (ii) -8 (iii) 0 (iv) 1
8. (i) -2, -1, 0, 1 (ii) -7, -6, -5, -4, -3, -2, -1
(iii) -8, -7, -6, -5, -4
(iv) -27, -26, -25, -24, -23, -22, -21, -20
9. (i) -10, -7, -5, 0, 3 (ii) -12, -8, -3, 4, 5
(iii) -18, -15, -13, 1, 12 (iv) -10, -9, -7, -6, -5
10. (i) -3, -6, -7, -10, -11 (ii) 8, 0, -5, -6, -9
(iii) 4, -2, -3, -5, -8 (iv) -2, -4, -6, -7, -10
11. -17, -16, -15, -14, -13

12. (i) $3 > 0$ (ii) $0 > -8$ (iii) $-9 < -3$ (iv) $-3 < 3$

(v) $5 > -1$ (vi) $-13 < 0$ (vii) $-8 > -18$

13. (i) 11 (ii) 4 (iii) -3 (iv) -9

14. (i) False (ii) True (iii) True (iv) False

(v) True

Exercise 3.2

1. (i) $10001 + (-2) = \mathbf{9999}$ (ii) $-99005 + 360 = -\mathbf{98645}$

(iii) $-245 + 111 = -\mathbf{134}$ (iv) $2567 + (-3) = \mathbf{2564}$

(v) $-498 + (-320) = -\mathbf{818}$ (vi) $-8994 + 0 = -\mathbf{8994}$

(vii) $3003 + (-999) = \mathbf{2004}$ (viii) $2884 + (-2884) = \mathbf{0}$

(ix) $2547 + (-2548) = -\mathbf{1}$

(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) $(-391) + (-81) + 9 + (-18)$
 $= -391 - 81 + 9 - 18$
 $= 9 - (391 + 81 + 18)$
 $= 9 - 490 = -\mathbf{481}$

(iii) $100 + (-66) + (-34) = 100 - 66 - 34$
 $= 100 - (66 + 34)$
 $= 100 - 100 = \mathbf{0}$

(iv) $1262 + (-366) + (-962) + 566$
 $= 1262 + 566 - (366 + 962)$
 $= 1828 - 1328 = \mathbf{500}$

(v) $373 + (-245) + (-373) + 145 + 3000$
 $= 373 + 145 + 3000 - (245 + 373)$
 $= 3518 - 618 = \mathbf{2900}$

(vi) $1 + (-475) + (-475) + (-475) + (-475) + 1900$
 $= 1 + 1900 - (475 + 475 + 475 + 475)$
 $= 1901 - 1900 = \mathbf{1}$

(vii) $1000 + 514 + (-517) + (-999)$
 $= 1000 + 514 - (517 + 999)$
 $= 1514 - 1516 = -\mathbf{2}$

(viii) $1024 + 512 + (-256) + (-128) + 64$

$$= 1024 + 512 + 64 - (256 + 128)$$

$$= 1600 - 384 = \mathbf{1216}$$

$$(ix) -243 + 27 + (-9) + 729 + (-1)$$

$$= 27 + 729 - (243 + 9 + 1)$$

$$= 756 - 253 = \mathbf{503}$$

$$(x) (-1) + (-304) + 304 + 304 + (-304) + 1$$

$$= -1 - 304 + 304 + 304 - 304 + 1$$

$$= (304 + 304 + 1) - (304 + 304 + 1)$$

$$= 609 - 609 = \mathbf{0}$$

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

6. Sum of two integers = 145

First integer = -39

Let other integer = x

Then, $x + (-39) = 145$

$$x - 39 = 145$$

$$x = 145 + 39 = \mathbf{184}$$

Thus, 184 is the other integer.

7. Sum of -36 and 114 = $-36 + 114 = 78$

Sum of -128 and 59 = $-128 + 59 = -69$

Then, $-69 - 78 = -\mathbf{147}$

8. Sum of two integers = -384

$$129 + x = -384$$

$$x = -384 - 129 = -\mathbf{513}$$

9. Sum 528 and (-129)

$$= 528 + (-129) = 399$$

$$\text{Subtraction} = -317 - 399 = -\mathbf{716}$$

10. Difference of -39 and 64 = $-39 - 64 = -103$

Addition of -116 and -103 = $(-116) + (-103) = -\mathbf{219}$

11. (i) 0 (ii) -15 (iii) 44 (iv) 17

(v) 488 (vi) 372

12. (i) False (ii) True (iii) False (iv) True

(v) True (vi) True (vii) False (viii) False

(ix) False (x) False

13. Here two integers x and y are such that x is the successor of y

Then, $x = y + 1$

Given equation = $x - y + 2$

put the value of x in given equation

$$= y + 1 - y + 2$$

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

Thus, 3 is the value of given equation.

Exercise 3.3

1. (i) False (ii) True (iii) False (iv) True (v) False
2. (i) $(-8) \times 0 \times 37 \times (-37) = \mathbf{0}$
- (ii) $(1569 \times 887) - (569 \times 887) = 887 \times (1569 - 569)$
 $= 887 \times 1000 = \mathbf{887000}$
- (iii) $(-183) \times (-44) + (-183) \times (-56)$
 $= (-183)[-44 - 56]$
 $= -183 \times -100 = \mathbf{18300}$
- (iv) $18946 \times 99 - (-18946) = 18946[99 - (-1)]$
 $= 18946 [99 + 1]$
 $= 18946 \times 100 = 1894600$
- (v) $15625 \times (-2) + (-15625) \times 98 = 15625 \times (-2 - 98)$
 $= 15625 \times (-100)$
 $= -\mathbf{1562500}$
- (vi) $(-80 \times (10 - 5 - 43 + 98)) = (-80) \times (108 - 48)$
 $= (-80) \times (60) = -\mathbf{4800}$
3. (i) $2 \times (-15) = -\mathbf{30}$
- (ii) $(-225) \times 8 = -\mathbf{1800}$
- (iii) $(-17) \times (-20) = \mathbf{340}$
- (iv) $3 \times (-8) \times 5 = -\mathbf{120}$
- (v) $9 \times (-3) \times (-6) = 9 \times 18 = \mathbf{162}$
- (vi) $(-12) \times (-12) \times (-12) = -\mathbf{1728}$
- (vii) $(-2) \times 36 \times (-5) = -72 \times -5 = 360$
- (viii) $(-8) \times (-43) \times 0 = \mathbf{0}$
- (ix) $18 \times (-185) \times -4 = 18 \times 740 = \mathbf{13320}$
- (x) $(-45) \times 55 \times (-10) = -45 \times -550 = \mathbf{24750}$
- (xi) $(-1) \times (-2) \times (-3) \times (-4) \times (-5) = -\mathbf{120}$
- (xii) $(-3) \times (-6) \times (-9) \times (-12) = 18 \times 108 = \mathbf{1944}$
4. (i) -1 (ii) 281 (iii) 0 (iv) -128
(v) -59 (vi) -756
5. (i) $(-18) \div 3 = \frac{-18}{3} = -\mathbf{6}$
- (ii) $18 \div -3 = \frac{18}{-3} = -\mathbf{6}$
- (iii) $(-18) \div (-3) = \frac{-18}{-3} = \mathbf{6}$
- (iv) $36 \div (-9) = \frac{36}{-9} = -\mathbf{4}$
- (v) $0 \div 12 = \frac{0}{12} = \mathbf{0}$

$$(vi) (-48) \div (-16) = \frac{-48}{-16} = \mathbf{3}$$

$$(vii) (-15625) \div (-125) = \frac{-15625}{-125} = \mathbf{125}$$

$$(viii) (-1728) \div 12 = \frac{-1728}{12} = \mathbf{-144}$$

$$(ix) (-729) \div (-81) = \frac{-729}{-81} = \mathbf{9}$$

$$(x) 10569 \div (-1) = \frac{10569}{-1} = \mathbf{-10569}$$

$$(xi) 17699 \div (-17699) = \frac{17699}{-17699} = \mathbf{-1}$$

$$(xii) 200000 \div (-100) = \frac{200000}{-100} = \mathbf{-2000}$$

6. (i) False (ii) False (iii) True (iv) True
(v) True (vi) False

7. Product of two integers = 1728

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

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

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

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

Thus, -72 is the other integer.

8. Let the required integer = x

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

$$x = (-124) \times (-1) = \mathbf{124}$$

Thus, 124 is the required integer.

9. Let the other integer = x

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

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

Thus, other integer is 65.

10. Let the integer = x

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

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

Thus, required integer is 325.

11. Positive

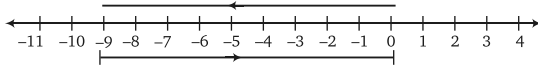
Exercise 3.4

1. (i) False (ii) True (iii) True (iv) True (v) True
(vi) False (vii) False (viii) False
2. (i) $(-2)^3$, base = -2, exponent = 3
(ii) 1^1 , base = 1, exponent = 1
(iii) 5^4 , base = 5, exponent = 4
(iv) $(-6)^1$, base = -6, exponent = 1
(v) $(-27)^2$, base = -27, exponent = 2
3. (i) 10^4
(ii) $(-13)^6$
4. (i) $(1)^4 = 1$
(ii) $2^4 = 2 \times 2 \times 2 \times 2 = 16$
(iii) $3^4 = 3 \times 3 \times 3 \times 3 = 81$
(iv) $(-1)^4 = -1 \times -1 \times -1 \times -1 = 1$
(v) $(-2)^4 = -2 \times -2 \times -2 \times -2 = 16$
(vi) $(-3)^4 = -3 \times -3 \times -3 \times -3 = 81$
5. (i) LHS = $(-2)^4 \times (-2)^3 = -2 \times -2 \times -2 \times -2 \times -2 \times -2 \times -2$
 $\times -2 \times -2$
 $(-2)^7 = \text{RHS}$
(ii) LHS = $10^2 \times 10^3 = 10 \times 10 \times 10 \times 10 \times 10 = 10^5 = \text{RHS}$
(iii) LHS = $\frac{(-7)^7}{(-7)^3} = (-7)^4 = (-1)^4 \times (7)^4 = (7)^4 = \text{RHS}$
(iv) LHS = $\frac{3^7}{3^2} = 3^{7-2} = 3^5 = \text{RHS}$
6. Do yourself.

Revision Exercise

1. (i) False (ii) False (iii) True (iv) False
2. (i) -25 (ii) -100 (iii) +3 (iv) +16
3. (i) Spending money (ii) Going west/Coming East
(iii) Rise in temperature (iv) 200 AD
4. (i) 1, 2, 3, 4, 5 (ii) -5, -4, -3, -2, -1, 0
(iii) -2, -1, 0, 1 (iv) 0, 1, 2, 3, 4
5. (i) $32 - (-20) = 32 + 20 = 52$
(ii) $(-20) - 119 = -20 - 119 = -139$
(iii) $-19 - (-28) = -19 + 28 = 9$
(iv) $142 - (-16) = 142 + 16 = 158$

6. (i) 8 more than $-9 = -1$



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

7. (i) $4 - 10 = -6$

(ii) $8 - 3 = 5$

(iii) $-100 - (-200) = -100 + 200 = 100$

(iv) $10 - (-15) = 10 + 15 = 25$

8. Sum of 998 and $-486 = 998 + (-486) = 512$,

Sum of -290 and $732 = -290 + 732 = 442$

Subtract $= 442 - 512 = -70$

9. Let other integer = x

$$x + (-24) = 48 \Rightarrow x - 24 = 48$$

$$x = 48 + 24 = 72$$

10. (i) $(8 + 9) \times 10 = 17 \times 10 = 170$

$$8 + 9 \times 10 = 8 + 90 = 98$$

$$\therefore 170 > 98 \therefore (8 + 9) \times 10 > 8 + 9 \times 10$$

- (ii) $(8 - 9) \times 10 = -1 \times 10 = -10$

$$8 - 9 \times 10 = 8 - 90 = -82$$

$$\therefore -10 > -82 \therefore (8 - 9) \times 10 > 8 - 9 \times 10$$

□

4.

Fractions

Exercise 4.1

1. (i) $\frac{4}{9}$ (ii) $\frac{7}{15}$ (iii) $\frac{1}{5}$ (iv) $\frac{3}{8}$ (v) $\frac{3}{7}$

2. Do it yourself

3. (i) $\frac{5}{11}$ (ii) $\frac{15}{23}$

4. $\frac{8}{24}$

Word Problems

1. Number of dresses for stitched = 35

Ekta has stitched = 21 dresses

Fraction of dresses has she stitched = $\frac{21}{35}$

2. Minute in an hour = 60 minutes

The required fraction = $\frac{45}{60}$ or $\frac{3}{4}$

3. Natural numbers are from 87 to 97 = 87, 88, 89, 90, 91, 92, 93
94, 95, 96, 97

Prime numbers = 89, 97

The required fraction = $\frac{2}{11}$

Exercise 4.2

1. (i), (iv) and (vii) are proper fractions; (ii), (vi) and (viii) are improper fractions; (iii) and (v) are mixed fractions

2. (i) $2\frac{1}{5} = \frac{10+1}{5} = \frac{11}{5}$ (ii) $3\frac{3}{7} = \frac{21+3}{7} = \frac{24}{7}$

(iii) $3\frac{2}{9} = \frac{29}{9}$ (iv) $5\frac{1}{7} = \frac{36}{7}$

(v) $6\frac{4}{9} = \frac{58}{9}$ (vi) $10\frac{3}{7} = \frac{73}{7}$

(vii) $8\frac{5}{11} = \frac{93}{11}$ (viii) $12\frac{3}{11} = \frac{135}{11}$

3. (i) $\frac{27}{5} = 5\frac{2}{5}$ 5) 27 (5

$$\begin{array}{r} 25 \\ \underline{} \\ 2 \end{array}$$

(ii) to (viii) Do yourself.

4. (i) First four equivalent fractions of $\frac{3}{7} = \frac{6}{14}, \frac{9}{21}, \frac{12}{28}, \frac{15}{35}$

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

5. (i) $\frac{5 \times 3}{8 \times 3} = \frac{15}{24}$ (ii) $\frac{7 \times 3}{19 \times 3} = \frac{21}{57}$

(iii) $\frac{10 \div 2}{12 \div 2} = \frac{5}{6}$ (iv) $\frac{120 \div 30}{150 \div 30} = \frac{4}{5}$

6. (i) Yes (ii) Yes (iii) No (iv) No

7. (i) $\frac{12}{27} = \frac{4}{9}$ (ii) $\frac{150}{350} = \frac{3}{7}$ (iii) $\frac{18}{81} = \frac{2}{9}$ (iv) $\frac{276}{115} = \frac{12}{5}$

8. $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ All are these equivalent fractions.

9. (i) 10 (ii) 108 (iii) 5 (iv) 5

10. (i) $\frac{36}{84}, \frac{30}{84}, \frac{44}{84}, \frac{27}{84}$ (ii) $\frac{90}{300}, \frac{80}{300}, \frac{84}{300}, \frac{195}{300}$

(iii) $\frac{98}{252}, \frac{156}{252}, \frac{140}{252}, \frac{119}{252}$ (iv) $\frac{180}{570}, \frac{160}{570}, \frac{165}{570}, \frac{138}{570}$

11. (i) False (ii) True (iii) True (iv) True

12. (i) $\frac{7 \times 7}{8 \times 7} = \frac{49}{56}, \frac{5 \times 4}{14 \times 4} = \frac{20}{56}$ (ii), (iii) Do yourself.

Exercise 4.3

1. (i) $\frac{3}{8}, \frac{6}{8}, \frac{4}{8}, \frac{1}{8}, \frac{1}{8} < \frac{3}{8} < \frac{4}{8} < \frac{6}{8}$ (ii) $\frac{8}{9}, \frac{4}{9}, \frac{3}{9}, \frac{6}{9}, \frac{3}{9} < \frac{4}{9} < \frac{6}{9} < \frac{8}{9}$

2. (i) $>$, (ii) $>$, (iii) $<$, (iv) $>$,
(v) $<$, (vi) $<$, (vii) $<$, (viii) $>$,

3. (i) $>$, (ii) $=$, (iii) $>$, (iv) $>$,

4. (i) $\frac{3}{4}, \frac{5}{9}, \frac{5}{6}, \frac{7}{12}$

LCM of 4, 6, 9 and 12 = 36

$$\frac{3 \times 9}{4 \times 9}, \frac{5 \times 4}{9 \times 4}, \frac{5 \times 6}{6 \times 6}, \frac{7 \times 3}{12 \times 3} \Rightarrow \frac{27}{36}, \frac{20}{36}, \frac{30}{36}, \frac{21}{36}$$

Fraction in ascending order

$$\frac{20}{36} < \frac{21}{36} < \frac{27}{36} < \frac{30}{36} \text{ or } \frac{5}{9} < \frac{7}{12} < \frac{3}{4} < \frac{5}{6}$$

(ii), (iii) Do yourself.

(iv) $\frac{3}{7}, \frac{3}{11}, \frac{3}{5}, \frac{3}{2}, \frac{3}{13}, \frac{3}{4}, \frac{3}{17}$

Fractions in ascending order, $\frac{3}{17} < \frac{3}{13} < \frac{3}{11} < \frac{3}{7} < \frac{3}{5} < \frac{3}{4} < \frac{3}{2}$

5. (i) $\frac{3}{4}, \frac{3}{8}, \frac{5}{12} \Rightarrow$ LCM of 4, 8 and 12 = 24

$$\frac{3 \times 6}{4 \times 6}, \frac{3 \times 3}{8 \times 3}, \frac{5 \times 2}{12 \times 2} \Rightarrow \frac{18}{24}, \frac{9}{24}, \frac{10}{24}$$

Fractions in descending order, $\frac{18}{24} > \frac{10}{24} > \frac{9}{24}$ or $\frac{3}{4} > \frac{5}{12} > \frac{3}{8}$

(ii), (iii) Do yourself.

(iv) $\frac{1}{12}, \frac{1}{23}, \frac{1}{5}, \frac{1}{7}, \frac{1}{50}, \frac{1}{9}, \frac{1}{17}$

Fractions in descending order, $\frac{1}{5} > \frac{1}{7} > \frac{1}{9} > \frac{1}{12} > \frac{1}{17} > \frac{1}{23} > \frac{1}{50}$.

Exercise 4.4

1. (i) $1\frac{3}{4} + \frac{3}{8} = \frac{7}{4} + \frac{3}{8} = \frac{14}{8} + \frac{3}{8} = \frac{14+3}{8} = \frac{17}{8} = 2\frac{1}{8}$

(ii) $\frac{2}{5} + 2\frac{3}{15} + \frac{7}{10} = \frac{2}{5} + \frac{33}{15} + \frac{7}{10} = \frac{2}{5} + \frac{11}{5} + \frac{7}{10}$
 $= \frac{2 \times 2 + 11 \times 2 + 7}{10} = \frac{4 + 22 + 7}{10} = \frac{33}{10} = 3\frac{3}{10}$

(iii) $1\frac{7}{8} + 1\frac{1}{2} + 1\frac{3}{4} = (1 + 1 + 1) + \left(\frac{7}{8} + \frac{1}{2} + \frac{3}{4}\right) = 3 + \frac{7+4+6}{8}$
 $= 3 + \frac{17}{8} = 3 + 2\frac{1}{8} = 5\frac{1}{8}$

$$\begin{aligned}
 \text{(iv)} \quad 3\frac{3}{4} + 2\frac{1}{6} + 1\frac{5}{8} &= (3 + 2 + 1) + \left(\frac{3}{4} + \frac{1}{6} + \frac{5}{8}\right) \\
 &= 6 + \frac{3 \times 6 + 1 \times 4 + 5 \times 3}{24} \\
 &= 6 + \frac{18 + 4 + 15}{24} = 6 + \frac{37}{24} = 6 + 1\frac{13}{24} = 7\frac{13}{24}
 \end{aligned}$$

(v), (vi) Do yourself.

$$\begin{aligned}
 \text{2. (i)} \quad 1\frac{11}{12} - \frac{13}{16} &= \frac{23}{12} - \frac{13}{16} = \frac{23 \times 4 - 13 \times 3}{48} \\
 &= \frac{92 - 39}{48} = \frac{53}{48} = 1\frac{5}{48}
 \end{aligned}$$

$$\text{(ii)} \quad 2\frac{3}{4} - 1\frac{5}{6} = \frac{11}{4} - \frac{11}{6} = \frac{33 - 22}{12} = \frac{11}{12}$$

$$\begin{aligned}
 \text{(iii)} \quad 2\frac{5}{7} + \frac{3}{14} - \frac{13}{21} &= \frac{19}{7} + \frac{3}{14} - \frac{13}{21} \\
 &= \frac{19 \times 6 + 3 \times 3 - 13 \times 2}{42} \\
 &= \frac{114 + 9 - 26}{42} = \frac{97}{42} = 2\frac{13}{42}
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} \quad 3\frac{5}{6} - \frac{1}{6} - 1\frac{1}{12} &= \frac{23}{6} - \frac{1}{6} - \frac{13}{12} \\
 &= \frac{23 \times 2 - 1 \times 2 - 13}{12} = \frac{46 - 2 - 13}{12} \\
 &= \frac{31}{12} = 2\frac{7}{12}
 \end{aligned}$$

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

$$\begin{aligned}
 \text{(xi)} \quad 4\frac{3}{5} - 2\frac{7}{9} - 1\frac{2}{15} - \frac{2}{45} &= (4 - 2 - 1) + \left(\frac{3}{5} - \frac{7}{9} - \frac{2}{15} - \frac{2}{45}\right) \\
 &= 1 + \left(\frac{3 \times 9 - 7 \times 5 - 2 \times 3 - 2}{45}\right) \\
 &= 1 + \left(\frac{27 - 35 - 6 - 2}{45}\right) \\
 &= 1 + \frac{(-16)}{45} = \frac{45 - 16}{45} = \frac{29}{45}
 \end{aligned}$$

$$\text{3. (i)} \quad \frac{3}{7} \times \frac{2}{5} = \frac{6}{35}$$

$$\text{(ii)} \quad \frac{4}{9} \times \frac{3}{5} = \frac{4}{15}$$

$$\text{(iii)} \quad \frac{5}{12} \times 8 = \frac{5}{3} \times 2 = \frac{10}{3} = 3\frac{1}{3}$$

$$\text{(iv)} \quad \frac{7}{6} \times \frac{3}{14} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$(v) 3\frac{3}{8} \times 3\frac{6}{7} = \frac{27}{8} \times \frac{27}{7} = \frac{729}{56} = 13\frac{1}{56}$$

$$(vi) \frac{1}{2} \times \frac{1}{3} \times \frac{3}{4} = \frac{1}{8}$$

$$(vii) \frac{3}{7} \times \frac{5}{9} \times 4\frac{1}{5} = \frac{3}{7} \times \frac{5}{9} \times \frac{21}{5} = \frac{1}{1} = 1$$

$$(viii) 1\frac{1}{3} \times 1\frac{2}{7} \times 1\frac{1}{4} = \frac{4}{3} \times \frac{9}{7} \times \frac{5}{4} = \frac{15}{7} = 2\frac{1}{7}$$

$$4. (i) \frac{2}{3} \div 1\frac{1}{5} = \frac{2}{3} \div \frac{6}{5} = \frac{2}{3} \times \frac{5}{6} = \frac{5}{9}$$

$$(ii) 4\frac{1}{2} \div \frac{4}{9} = \frac{9}{2} \times \frac{9}{4} = \frac{81}{8} = 10\frac{1}{8}$$

$$(iii) 1 \div \frac{2}{5} = 1 \times \frac{5}{2} = \frac{5}{2} = 2\frac{1}{2}$$

$$(iv) \frac{4}{9} \div \frac{4}{9} = \frac{4}{9} \times \frac{9}{4} = 1$$

$$(v) 2\frac{1}{3} \div 1\frac{3}{4} = \frac{7}{3} \div \frac{7}{4} = \frac{7}{3} \times \frac{4}{7} = \frac{4}{3} = 1\frac{1}{3}$$

$$(vi) 2\frac{2}{3} \times 3\frac{1}{2} \div 2\frac{4}{9} = \frac{8}{3} \times \frac{7}{2} \div \frac{22}{9} = \frac{8}{3} \times \frac{7}{2} \times \frac{9}{22} = \frac{42}{11} = 3\frac{9}{11}$$

$$5. (i) \frac{1}{4} \text{ of } 2\frac{2}{7} \div \frac{3}{5} = \frac{1}{4} \times \frac{16}{7} \times \frac{5}{3} = \frac{20}{21}$$

$$(ii) 1\frac{1}{4} \times \frac{1}{2} \div 1\frac{1}{3} = \frac{5}{4} \times \frac{1}{2} \div \frac{4}{3} = \frac{5}{4} \times \frac{1}{2} \times \frac{3}{4} = \frac{15}{32}$$

$$(iii) 6\frac{1}{7} \times 0 \times 5\frac{3}{8} = 0$$

$$(iv) \frac{3}{4} \times 1\frac{1}{3} \div \frac{3}{7} \text{ of } 2\frac{5}{8} = \frac{3}{4} \times \frac{4}{3} \div \frac{3}{7} \times \frac{21}{8} = \frac{3}{4} \times \frac{4}{3} \div \frac{9}{8} = 1 \times \frac{8}{9} = \frac{8}{9}$$

Exercise 4.5

$$1. 12 - [9 - \{15 - (12 - 9 - 5)\}]$$

$$= 12 - [9 - \{15 - (12 - 4)\}]$$

$$= 12 - [9 - \{15 - 8\}]$$

$$= 12 - [9 - 7] = 12 - 2 = \mathbf{10}$$

$$2. 3 \div [3 \text{ of } \{15 - (2 + 3)\}]$$

$$= 3 \div [3 \times \{15 - 5\}]$$

$$= 3 \div [3 \times 10] = 3 \times \frac{1}{3 \times 10} = \frac{1}{10}$$

$$3. 11\frac{3}{4} \div \left[5\frac{1}{6} + \left\{ 3\frac{1}{2} - \left(1\frac{2}{3} + \frac{3}{2} \right) \right\} \right]$$

$$= \frac{47}{4} \div \left[\frac{31}{6} + \left\{ \frac{7}{2} - \left(\frac{19}{6} \right) \right\} \right]$$

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

$$\begin{aligned}
\mathbf{4.} \quad & 5 \frac{1}{12} - \left[12 \frac{1}{2} - \left\{ 3 \frac{3}{4} \text{ of } \left(5 \frac{1}{3} - 4 \frac{1}{6} - 3 \frac{4}{5} \right) \right\} \right] \\
&= \frac{61}{12} - \left[\frac{25}{2} - \left\{ \frac{15}{4} \times \left(\frac{16}{3} - \frac{25}{6} - \frac{19}{5} \right) \right\} \right] \\
&= \frac{61}{12} - \left[\frac{25}{2} - \left\{ \frac{15}{4} \times \left(\frac{160-125-114}{30} \right) \right\} \right] \\
&= \frac{61}{12} - \left[\frac{25}{2} - \left(\frac{15}{4} \times \frac{-79}{30} \right) \right] \\
&= \frac{61}{12} - \left[\frac{25}{2} + \frac{79}{8} \right] = \frac{61}{12} - \left[\frac{100+79}{8} \right] \\
&= \frac{2 \times 61 - 179 \times 3}{24} = \frac{122 - 537}{24} \\
&= -\frac{415}{24} = -17 \frac{7}{24}
\end{aligned}$$

$$\begin{aligned}
\mathbf{5.} \quad & 3 \frac{1}{10} - \left[7 \frac{1}{2} - \left\{ \frac{7}{10} - \left(\frac{5}{6} - \frac{2}{3} - \frac{1}{9} \right) \right\} \right] \\
&= \frac{31}{10} - \left[\frac{15}{2} - \left\{ \frac{7}{10} - \left(\frac{15-12-2}{18} \right) \right\} \right] = \frac{31}{10} - \left[\frac{15}{2} - \left(\frac{7}{10} - \frac{1}{18} \right) \right] \\
&= \frac{31}{10} - \left[\frac{15}{2} - \left(\frac{63-5}{90} \right) \right] = \frac{31}{10} - \left[\frac{15}{2} - \frac{58}{90} \right] \\
&= \frac{31}{10} - \frac{675-58}{90} = \frac{9 \times 31 - 617}{90} = \frac{279-617}{90} \\
&= -\frac{338}{90} = -\frac{169}{45} = -3 \frac{34}{45}
\end{aligned}$$

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

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

$$\begin{aligned}
7. \quad &\left(2\frac{1}{3} - 1\frac{2}{3} \right) \text{ of } \left[7 + \left\{ 5\frac{1}{9} - \left(6 - \frac{1}{3} - \frac{1}{2} \right) \right\} \right] \\
&= \left(\frac{7}{3} - \frac{5}{3} \right) \times \left[7 + \left\{ \frac{46}{9} - \left(6 + \frac{1}{6} \right) \right\} \right] \\
&= \frac{2}{3} \times \left[7 + \left(\frac{92 - 111}{18} \right) \right] = \frac{2}{3} \times \left[7 - \frac{19}{18} \right] \\
&= \frac{2}{3} \times \frac{107}{18} = \frac{107}{27} = 3\frac{26}{27}
\end{aligned}$$

Word Problems

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

$$\begin{aligned}\text{Length of the remaining rope} &= \frac{41}{2} \text{ m} - \frac{29}{8} \text{ m} \\ &= \frac{164 - 29}{8} = \frac{135}{8} = \mathbf{16 \frac{7}{8} \text{ m}}\end{aligned}$$

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 = ₹ $18 \frac{3}{4}$ = ₹ $\frac{75}{4}$

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

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

Amount of money left with him = ₹ $\frac{117}{2} - ₹ \frac{499}{20} = \frac{1170 - 499}{20}$
 = ₹ $\frac{671}{20}$ or ₹ $33 \frac{11}{20}$

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

6. Total weight of all the three packets

$$= 2 \frac{3}{4} \text{ kg} + 3 \frac{1}{3} \text{ kg} + 5 \frac{2}{5} \text{ kg}$$

$$= (2 + 3 + 5) + \left(\frac{3}{4} + \frac{1}{3} + \frac{2}{5} \right)$$

$$= 10 + \frac{45 + 20 + 24}{60} = 10 + \frac{89}{60}$$

$$= 10 + 1 \frac{29}{60} = 11 \frac{29}{60} \text{ kg}$$

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

In 1 part journey covered = $\frac{12}{\frac{3}{4}} = \frac{12 \times 4}{3} = 16$ 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
 Part read by Ayushi = $\frac{2}{5}$

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
 $\frac{3}{10}$ part spent on food = $7200 \times \frac{3}{10} = ₹ 2160$
 $\frac{1}{4}$ part spent on rent = $7200 \times \frac{1}{4} = ₹ 1800$

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

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

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

$$\text{Saving} = \text{Total earning} - \text{Total expenses}$$

$$\text{Saving} = ₹ 7200 - ₹ 5256$$

$$\text{Saving} = ₹ \mathbf{1944}$$

Thus, ₹ 1944 is the total savings of man.

10. Mohit exercised = $\frac{3}{6}$ of an hour = $\frac{3}{6} \times 60 \text{ min} = 30 \text{ min}$

$$\text{Rohit exercised} = \frac{3}{4} \text{ of an hour} = \frac{3}{4} \times 60 \text{ min} = 45 \text{ min}$$

Rohit exercised for longer time

Difference of duration between both = $45 - 30 = 15 \text{ min}$

$$\text{Required fraction} = \frac{15}{60} = \frac{1}{4} \text{ hour}$$

11. Fraction of oranges was left in basket = $1 - \frac{5}{7} = \frac{2}{7}$

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

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

$$\text{Number of girls} = 100$$

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

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

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

Thus, number of boys students is 400.

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

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

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

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

Thus, 20 km is the full length of journey.

Revision Exercise

1. (i) $\frac{4}{7}$ (ii) $\frac{3}{8}$ (iii) $\frac{1}{8}$

2. (i) $\frac{2}{7}$ (ii) $\frac{5}{17}$ (iii) $\frac{3}{5}$

3. (i) proper (ii) improper.

4. (i) $\frac{11}{5}$ (ii) $\frac{13}{4}$ (iii) $\frac{57}{8}$ (iv) $\frac{23}{11}$

5. (i) $5\frac{15}{17}$ (ii) $7\frac{4}{11}$ (iii) $-29\frac{6}{7}$ (iv) $-7\frac{8}{15}$

6. (i) $\frac{5}{17}, \frac{4}{9}, \frac{7}{12} = \frac{5 \times 36}{612}, \frac{4 \times 68}{612}, \frac{7 \times 51}{612} = \frac{180}{612}, \frac{272}{612}, \frac{357}{612}$

$$\text{Descending order } \frac{357}{612} > \frac{272}{612} > \frac{180}{612} \Rightarrow \frac{7}{12} > \frac{4}{9} > \frac{5}{17}$$

(ii) Do yourself.

7. (i) $\frac{7}{8}, \frac{15}{16}, \frac{5}{6} = \frac{7 \times 6}{48}, \frac{15 \times 3}{48}, \frac{5 \times 8}{48} \Rightarrow \frac{42}{48}, \frac{45}{48}, \frac{40}{48}$

Ascending order

$$\frac{40}{48} < \frac{42}{48} < \frac{45}{48} \text{ or } \frac{5}{6} < \frac{7}{8} < \frac{15}{16}$$

(ii), (iii) Do yourself.

8. (i) $1\frac{2}{3} + 2\frac{1}{2} + \frac{3}{4} = (1 + 2) + \left(\frac{2}{3} + \frac{1}{2} + \frac{3}{4}\right)$

$$= 3 + \left(\frac{8+6+9}{12}\right) = 3 + \frac{23}{12}$$

$$= 3 + 1\frac{11}{12} = 4\frac{11}{12}$$

(ii), (iii) Do yourself.

$$\begin{aligned}
 \mathbf{9. (i)} \quad 5 - \left(\frac{8}{11} - 3 \frac{3}{11} \right) &= 5 - \left(\frac{8-36}{11} \right) \\
 &= 5 - \left(\frac{-28}{11} \right) = 5 + \frac{28}{11} \\
 &= 5 + 2 \frac{6}{11} = 7 \frac{6}{11}
 \end{aligned}$$

(ii), (iii) Do yourself.

$$\begin{aligned}
 \mathbf{(iv)} \quad \left(3 \frac{7}{8} - 3 \frac{3}{5} \right) \div \frac{1}{2} &= \left[(3-3) + \left(\frac{7}{8} - \frac{3}{5} \right) \right] \div \frac{1}{2} \\
 &= \left(0 + \frac{35-24}{40} \right) \times \frac{2}{1} = \frac{11}{40} \times 2 = \frac{11}{20}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{10. (i)} \quad 8 \frac{1}{4} \text{ of } \left[5 \frac{1}{2} - \frac{1}{3} \text{ of } \left(2 \frac{2}{3} - 1 \frac{1}{2} \right) \right] \\
 &= \frac{33}{4} \times \left[\frac{11}{2} - \frac{1}{3} \times \left\{ (2-1) + \left(\frac{2}{3} - \frac{1}{2} \right) \right\} \right] \\
 &= \frac{33}{4} \times \left[\frac{11}{2} - \frac{1}{3} \left(1 + \frac{1}{6} \right) \right] \\
 &= \frac{33}{4} \times \left[\frac{11}{2} - \frac{1}{3} \times \frac{7}{6} \right] = \frac{33}{4} \times \left[\frac{11}{2} - \frac{7}{18} \right] \\
 &= \frac{33}{4} \times \frac{99-7}{18} = \frac{11}{4} \times \frac{92}{6} \\
 &= \frac{11}{1} \times \frac{23}{6} = \frac{253}{6} = 42 \frac{1}{6}
 \end{aligned}$$

$$\begin{aligned}
 \mathbf{(ii)} \quad 21 \frac{1}{9} \div \left[\frac{5}{9} \text{ of } \left\{ 3 \frac{1}{27} - \left(6 - \frac{1}{3} - \frac{1}{6} \right) \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \left(6 - \frac{2-1}{6} \right) \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \left(6 - \frac{1}{6} \right) \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{82}{27} - \frac{35}{6} \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \text{ of } \left\{ \frac{164-315}{54} \right\} \right] \\
 &= \frac{190}{9} \div \left[\frac{5}{9} \times \left(\frac{-151}{54} \right) \right]
 \end{aligned}$$

$$\begin{aligned}
 &= \frac{190}{9} \div \left[\frac{-755}{486} \right] = \frac{190}{9} \times \left(\frac{-486}{755} \right) = \frac{38}{1} \times \left(\frac{-54}{151} \right) \\
 &= \frac{38 \times (-54)}{151} = -\frac{2052}{151} = -\mathbf{13 \frac{89}{151}}
 \end{aligned}$$

11. Total length of rope = $10\frac{1}{2}$ m = $\frac{21}{2}$ m

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

Length of remaining rope = Total length of rope

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

Thus, length of the remaining rope is $5\frac{7}{8}$ 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 = $500 - (60 + 100) = 340$

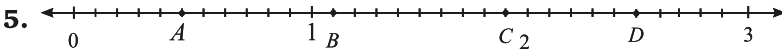
Thus, 340 oranges left in the box.



5.

Decimals

Exercise 5.1

- (i) 0.05 (ii) 4.307
(iii) 58.384 (iv) 234.701
- (i) 17.500, 3.912 (ii) 5.0400, 13.1902
(iii) 2.451, 3.700, 28.340 (iv) 3.1000, 2.6780, 27.0103.
- (i) $123.7 = 100 + 20 + 3 + 0.7 = 100 + 20 + 3 + \frac{7}{10}$
(ii), (iii) Do yourself.
- (i) $200 + 60 + 5 + \frac{3}{10} = 265 + 0.3 = 265.3$
(ii), (iii) Do yourself.
(iv) $600 + 7 + \frac{3}{100} + \frac{6}{1000} = 607 + 0.03 + 0.006 = 607.036$
- 

(i) 0.4 (ii) 1.1 (iii) 1.9 (iv) 2.5
- (i) 2.5 (ii) 20.9 (iii) 600.8 (iv) 205.05
(v) 7.015
- The decimal numbers represented by points A, B, C and D are 0.8, 1.3, 2.2 and 2.9 respectively.
- (i) Thirty point five or thirty and five tenths
(ii) Zero point zero three
(iii) One hundred eight point five six
(iv) Forty seven point two zero
(v) Five point zero zero eight
(vi) Twenty six point zero three nine

Exercise 5.2

- (i) $\frac{531}{10} = 53.1$ (ii) $\frac{422}{100} = 4.22$ (iii) $\frac{58301}{1000} = 58.301$
(iv) $\frac{7}{10} = 0.7$ (v) $\frac{3}{100} = 0.03$ (vi) $\frac{37}{1000} = 0.037$
- (i) $54.22 = \frac{5422}{100}$ (ii) $318.115 = \frac{318115}{1000}$
(iii) $0.27 = \frac{27}{100}$ (iv) $0.052 = \frac{52}{1000}$ (v) $0.01 = \frac{1}{100}$
(vi) $34.5 = \frac{345}{10}$

3. (i) $0.8 = \frac{8}{10} = \frac{4}{5}$ (ii) $0.04 = \frac{4}{100} = \frac{1}{25}$
 (iii) $0.125 = \frac{125}{1000} = \frac{1}{8}$ (iv) $0.225 = \frac{225}{1000} = \frac{9}{40}$
 (v) $0.066 = \frac{66}{1000} = \frac{33}{500}$ (vi) $0.092 = \frac{92}{1000} = \frac{23}{250}$
4. (i) $31.6 = 31 + \frac{6}{10} = 31 + \frac{3}{5} = 31\frac{3}{5}$
 (ii), (iii) Do yourself.
 (iv) $95.95 = 95 + \frac{95}{100} = 95 + \frac{19}{20} = 95\frac{19}{20}$
5. (i) $\frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10} = 0.8$ (ii) $\frac{6}{25} = \frac{6 \times 4}{25 \times 4} = \frac{24}{100} = 0.24$
 (iii), (iv), (v) Do yourself.
 (vi) $7\frac{3}{40} = 7 + \frac{3 \times 25}{40 \times 25} = 7 + \frac{75}{1000} = 7.075$
6. (i) $0.3, 0.4 \Rightarrow 0.4 > 0.3$, (ii) $1, 0.99 \Rightarrow 1 > 0.99$
 (iii) $1.09, 1.093 \Rightarrow 1.090, 1.093 \Rightarrow 1.093 > 1.090$
 (iv) $0.5, 0.05 \Rightarrow 0.50, 0.05 \Rightarrow 0.50 > 0.05$
7. (i) $45.78, 345.8 \Rightarrow 45.78 < 345.8$
 (ii) $37.701, 37.71 \Rightarrow 37.701, 37.710 \Rightarrow 37.701 < 37.710$
 (iii) $5.907, 5.903 \Rightarrow 5.903 < 5.907$
8. (i) $27.35, 27.305, 2.7, 2.543$
 Expressing the given decimals as like decimals we get,
 $27.350, 27.305, 2.700, 2.543$
 Ascending order of given decimals
 $2.543 < 2.700 < 27.305 < 27.350$
 or $2.543 < 2.7 < 27.305 < 27.35$
 (ii) Do yourself.
9. (i) $3.303, 33.03, 3.3, 30.33$
 Expressing the given decimals as like decimals
 $3.303, 33.030, 3.300, 30.330$
 Descending order of given decimals
 $33.030 > 30.330 > 3.303 > 3.300$
 or $33.03 > 30.33 > 3.303 > 3.3$
 (ii) Do yourself.

Exercise 5.3

-
1. (i) $\begin{array}{r} 17.5 \\ + 8.8 \\ \hline 26.3 \end{array}$ (ii) $\begin{array}{r} 9.999 \\ + 0.030 \\ \hline 10.029 \end{array}$ (iii) $\begin{array}{r} 5.87 \\ 1.03 \\ + 0.10 \\ \hline 7.00 \end{array}$

(iv), (v), (vi), (vii), (viii) Do yourself.

$$\begin{array}{r} \text{2. (i) } 6.80 \\ - 2.64 \\ \hline 4.16 \end{array} \quad \begin{array}{r} \text{(ii) } 2.0000 \\ - 1.0304 \\ \hline 0.9696 \end{array} \quad \begin{array}{r} \text{(iii) } 0.10 \\ \underline{0.08} \\ 0.02 \end{array}$$

(iv), (v), (vi), (vii), (viii) Do yourself.

$$\begin{array}{r} \text{3. (i) } 5.82 \\ - 2.65 \\ \hline 3.17 \end{array} \quad \begin{array}{r} \text{(ii) } 19.010 \\ - 12.234 \\ \hline 6.776 \end{array} \quad \begin{array}{r} \text{(iii) } 15.4 + 3.015 - 14.237 \\ 15.400 \quad 18.415 \\ + 3.015 \quad - 14.237 \\ \hline 18.415 \quad 4.178 \end{array}$$

(iv), (v), (vi) Do yourself.

Word Problems

- Sum of 2.43 and 4.349 = $2.43 + 4.349 = 6.779$
Sum of 0.8 and 3.15 = $0.8 + 3.15 = 3.95$
Subtraction = $6.779 - 3.95 = 2.829$
- Required number = $1 - 0.756 = 0.244$
- The last number = $1000 - 89.376 = 910.624$
- Let the required number be x .
 $17.45 - x = 7.9702 \Rightarrow x = 17.45 - 7.9702 \Rightarrow x = 9.4798$
- Sum of 18.0495 and 34.9644 = $18.0495 + 34.9644 = 53.0139$
Sum of 7.6752 and 24.876 = $7.6752 + 24.876 = 32.5512$
Exceed = $53.0139 - 32.5512 = 20.4627$

Exercise 5.4

- (i) 48 m into km $\Rightarrow 1 \text{ m} = \frac{1}{1000} \text{ km}$
 $\therefore 48 \text{ m} = \frac{48}{1000} \text{ km} = 0.048 \text{ km}$
(ii) Do yourself.
(iii) $24 \text{ km } 37 \text{ m} = 24 \text{ km} + 37 \text{ m} = 24 \text{ km} + \frac{37}{1000} \text{ km}$
 $= 24 + 0.037 = 24.037 \text{ km}$
(iv) Do yourself.
(v) $275 \text{ cm} = \frac{275}{100} = 2.75 \text{ m}$ (vi) Do yourself.
(vii) Do yourself.
(viii) $8 \text{ cm } 6 \text{ mm} = 8 \text{ cm} + \frac{6}{10} \text{ cm} = 8.6 \text{ cm}$
- (i) $85 \text{ L} = \frac{85}{1000} = 0.085 \text{ kL}$
(ii), (iii), (iv) Do yourself.

$$(v) 324 \text{ mL} = \frac{324}{1000} \text{ L} = 0.324 \text{ L},$$

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

3. (i) $856 \text{ g} = \frac{856}{1000} \text{ kg} = 0.856 \text{ kg},$

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

(v) $24 \text{ mg} = \frac{24}{1000} \text{ g} = 0.024 \text{ g}$

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

4. (i) $8 \text{ paise} = ₹ \frac{8}{100} = ₹ 0.08$

(ii), (iii), (iv), (v), (vi), (vii) Do yourself.

(viii) $86 \text{ rupees } 99 \text{ paise} = ₹ 86 + \frac{99}{100} = ₹ 86.99$

5. (i) 5.37 (ii), (iii), (iv) Do yourself.

$$\begin{array}{r} 12.00 \\ \hline ₹ 17.37 \end{array}$$

6. (i) 63.22 (ii), (iii) Do yourself.

$$\begin{array}{r} - 35.74 \\ \hline ₹ 27.48 \end{array}$$

7. (i) 2.40 (ii), (iii) Do yourself.

$$\begin{array}{r} + 1.78 \\ \hline 4.18\text{m} \end{array}$$

8. (i) 19.60 (ii), (iii) Do yourself.

$$\begin{array}{r} - 5.03 \\ \hline 14.57 \text{ m} \end{array}$$

9. (i) 57.864 (ii), (iii) Do yourself.

$$\begin{array}{r} + 2.060 \\ \hline 59.924 \text{ kg} \end{array}$$

10. (i) 15.600 (ii), (iii) Do yourself.

$$\begin{array}{r} - 9.462 \\ \hline 6.138 \text{ kg} \end{array}$$

11. (i) 0.001 kL (ii) 0.001 kg

(iii) 0.001 km (iv) 0.001 g

12. (i) $5 \text{ L} + 0.286 \text{ L} = 5.286 \text{ L}$ (ii), (iii) Do yourself.

13. (i) $19.4 \text{ L} - 12.347 \text{ L} = 7.053 \text{ L}$

(ii), (iii) Do yourself.

Word Problems

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

$$\begin{array}{r}
 \text{Amount of purchasing guavas} = 2 \text{ kg and } 10 \text{ g} \\
 \text{Total amount of the fruits} = 5 \text{ kg } 50 \text{ g} \\
 \qquad \qquad \qquad \qquad \qquad \qquad 2 \text{ kg } 300 \text{ g} \\
 \qquad \qquad \qquad \qquad \qquad \qquad \underline{+ 2 \text{ kg } 10 \text{ g}} \\
 \qquad \qquad \qquad \qquad \qquad \qquad \underline{9 \text{ kg } 360 \text{ g}}
 \end{array}$$

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

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

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

$$\begin{array}{r}
 \text{Total length of the cloth bought by her} \\
 = 2 \text{ m } 70 \text{ cm} + 2 \text{ m } 85 \text{ cm} \\
 = \mathbf{5 \text{ m } 55 \text{ cm}} \text{ or } \mathbf{5.55 \text{ m}}
 \end{array}$$

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

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

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

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

Cutted 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

$$\begin{array}{r}
 \text{Distance of her school from residence} \\
 = 15.268 + 7.007 + 0.500 \\
 = \mathbf{22.775 \text{ km}}
 \end{array}$$

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

11. Amount of money Ridhi has = ₹ 100 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

$$= ₹ 100 - ₹ 37.13 = ₹ \mathbf{62.87}$$

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



6. Algebraic Expressions

Exercise 6.1

- If the variable n stands for the number of letters formed, then the number of matchsticks required is given by (i) $2n$ (ii) $2n$ (iii) $3n$ (iv) $3n$ (v) $4n$ (vi) $5n$
- If the number of letter A's formed is x then the number of matchsticks required = $4x + 2$
- (i) $\frac{x+y}{2}$ (ii) $6 + x$ (iii) $x - 7$ (iv) $y + 3$
 (v) $7 - y$ (vi) $\frac{x}{y} - 2$ (vii) $2x + 3$ (viii) x^2
 (ix) $5z$ (x) $\frac{x}{3}$
- (i) $S = C + P$, where S = selling price, C = cost price, P = profit
 (ii) $A = P + I$, where A = amount, P = principal and I = Interest
- (i) 8 more than three times y (ii) 6 less than quotient of y and z
 (iii) 7 less than four times x (iv) 8 subtracted from product of x and z
 (v) 4 added to quotient of x and y (vi) 8 more than 50 times y
 (vii) 9 subtracted from 13 times y (viii) Product of p and l divided by z plus 8

Word Problems

- Let the number of boxes is b .
 Number of mangoes in a boxes = 24
 Total number of mangoes in b boxes = $24b$
- Number of dots in r row = $8r$
 If there are 12 rows, then
 Number of dots = $8 \times 12 = 96$
- Distance covered by a bird in one minute = 1.2 km
 Distance covered by a bird in t minute = $1.2t$ km

4. Speed of a car = $(x + 20)$ km/h
 5. Earning of Rajesh in a month = $5y$
 Money spend by Rajesh hor purchasing books and copies = $y + 10$
 Money left with Rajesh = $5y - (y + 10) = 4y - 10$

Exercise 6.2

1. (i) $3x^2y, 8yx^2; -6xy, -7yx; 9y^2x, 8xy^2$
 (ii) $15m^2n^2, -13n^2m^2, 7n^2m^2; 16n^2m^2p, 18pm^2n^2, -8m^2n^2p$
 (iii) $p^2l^2, l^2p^2, -9p^2l^2; -3pl, 8lp, -7pl$
 (iv) $12xy^2, -6y^2x, 13y^2x; 8x^2y^2, -9y^2x^2, 7x^2y^2$
2. (i) Terms $-13m^2n^2; -6mn; 8n^2$,
 Factors - $13, m, m, n, n; -6, m, n; 8, n, n$
 (ii) Terms $-5x^2, 7y^2, 8$, Factors - $5, x, x; 7, y, y; 8$
 (iii) Terms $-15x^3y^2, 5xy^2, -9y^3$,
 Factors - $15, x, x, x, y, y; 5, x, y, y; -9, y, y, y$
 (iv) Terms $-6l^2p, 8p^3, -9pl$, Factors - $6, l, l, p; 8, p, p, p; -9, p, l$
3. (i) -5 (ii) $\frac{16}{7}$ (iii) $\frac{-19}{8}$ (iv) 13
4. (i) $-y^3$ (ii) $16x$ (iii) $\frac{-9}{17}z$ (iv) $-n^3p$;
5. (i) binomial (ii) trinomial (iii) monomial
 (iv) polynomial (v) monomial (vi) binomial

Exercise 6.3

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) $10m^2 - 9m + 7m - 3m^2 - 5m - 8$
 $= 10m^2 - 3m^2 - 9m + 7m - 5m - 8$
 $= m^2(10 - 3) + m(-9 + 7 - 5) - 8$
 $= 7m^2 - 7m - 8$
- (vi), (vii) Do yourself.
 (viii) $xy^2 - y^2 + x^2 + xy^2 - 4y^2 - x^2 - 7$
 $= xy^2 + xy^2 - y^2 - 4y^2 + x^2 - x^2 - 7$
 $= 2xy^2 - 5y^2 - 7$

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

$$\begin{aligned} \text{On adding } \Rightarrow y^3 - 2y^3 - 3y^3 + 4y^3 &= y^3(1 - 2 - 3 + 4) \\ &= y^3(5 - 5) = y^3 \times 0 = \mathbf{0} \end{aligned}$$

(ii), (iii) Do yourself.

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

$$\begin{aligned} \text{On adding } \Rightarrow x^2y - 3x + 4 + (-8x^2y + 3x - 4) \\ &= x^2y - 3x + 4 - 8x^2y + 3x - 4 \\ &= x^2y - 8x^2y - 3x + 3x - 4 + 4 \\ &= x^2y(1 - 8) - 3x + 3x - 4 + 4 = \mathbf{-7x^2y} \end{aligned}$$

(v) Do yourself.

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

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

4. Do yourself.

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

$$\begin{aligned} &= 2a^2 + 3b^2 + 5a^2 - 2b^2 + ab - 6a^2 - 5ab + b^2 \\ &= 2a^2 + 5a^2 - 6a^2 + 3b^2 - 2b^2 + b^2 + ab - 5ab \\ &= a^2(2 + 5 - 6) + b^2(3 - 2 + 1) + ab(1 - 5) \\ &= \mathbf{a^2 + 2b^2 - 4ab} \end{aligned}$$

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

$$\begin{aligned} &= 3x^2 + 4x^2 - 5y^2 - 3y^2 - 4xy - 5xy \\ &= \mathbf{7x^2 - 8y^2 - 9xy} \end{aligned}$$

7. $[(3a - 5b + 3c) + (2a + 4b - 5c)] - (4a - b - c + 3)$

$$\begin{aligned} &= (5a - b - 2c) - (4a - b - c + 3) \\ &= 5a - b - 2c - 4a + b + c - 3 \\ &= \mathbf{a - c - 3} \end{aligned}$$

8. Do yourself.

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

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

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

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

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

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

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

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

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. Number of mangoes in x boxes = $56x$

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

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

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.



7. Linear Equations

Exercise 7.1

1. (i) $3x - 4 = 5$ (ii) $4x + 7 = 11$
(iii) $\frac{x}{2} + 3 = 7$ (iv) $\frac{x+3}{4} = 10$ or $\frac{1}{4}(x+3) = 10$
(v) $\frac{1}{5}x + \frac{3}{4} = -2$
2. (i) Three added to twice a number is equal to five
(ii) Two less than a number gives three
(iii) Half of five less than three times a number gives 1
(iv) A number divided by the sum of three and two given 5
(v) Half of three times a number increased by 11 is equal to zero
3. (i) $5x = 30$

We try several values of x and find the LHS

x	LHS	RHS
0	$5 \times 0 = 0$	30
1	$5 \times 1 = 5$	30
2	$5 \times 2 = 10$	30
5	$5 \times 5 = 25$	30
6	$5 \times 6 = 30$	30

Thus, for $x = 6$, LHS = RHS

Hence, $x = 6$

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

(v) $3y + 4 = 5y - 4$

We try several values of y and find LHS and RHS

y	LHS	RHS
0	$3 \times 0 + 4 = 4$	$5 \times 0 - 4 = -4$
2	$3 \times 2 + 4 = 10$	$5 \times 2 - 4 = 6$
4	$3 \times 4 + 4 = 16$	$5 \times 4 - 4 = 16$

Thus, for $y = 4$, LHS = RHS

Hence, $y = 4$

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

4. (i) $x + 7 = 12$

We try several values of x and find LHS and RHS

x	LHS	RHS
0	$0 + 7 = 7$	12
2	$2 + 7 = 9$	12
4	$4 + 7 = 11$	12
5	$5 + 7 = 12$	12

Thus, for $x = 5$, LHS = RHS

Hence, $x = 5$

(ii) $x - 15 = 20$

We try several values of x and find LHS and RHS

x	LHS	RHS
0	$0 - 15 = -15$	20
5	$5 - 15 = -10$	20
10	$10 - 15 = -5$	20
20	$20 - 15 = 5$	20
35	$35 - 15 = 20$	20

Thus, for $x = 35$, LHS = RHS

Hence, $x = 35$

(iii), (iv), (v), (vi) (vii) Do yourself.

(viii) $\frac{x}{5} - 3 = -2$

We try several values of x and find the LHS and RHS

x	LHS	RHS
0	$\frac{0}{5} - 3 = -3$	-2
5	$\frac{5}{5} - 3 = -2$	-2

Thus, for $x = 5$, LHS = RHS

5. (i) $x = 9$, Substituting the value of x in the equation, we get

$$3x^2 + 5 = 248$$

$$3 \times 9^2 + 5 = 248$$

$$3 \times 81 + 5 = 248 \Rightarrow 248 = 248$$

Hence, verified $x = 9$ is the root of the equation

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

(vi) $x = \frac{7}{2}$, Substituting the value of x in the equation, we get

$$\begin{aligned}16x^2 + 4x - 5 &= 205 \\16 \times \left(\frac{7}{2}\right)^2 + 4 \times \frac{7}{2} - 5 &= 205 \\16 \times \frac{49}{4} + 2 \times 7 - 5 &= 205 \\196 + 14 - 5 &= 205 \\205 &= 205\end{aligned}$$

Hence, verified $x = 7/2$ is the root of the equation.

Exercise 7.2

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.

$$(vi) \quad 2m - 3 = \frac{3}{10}(5m - 12)$$

$$\Rightarrow 10(2m - 3) = 3(5m - 12)$$

$$\Rightarrow 20m - 30 = 15m - 36$$

$$\Rightarrow 20m - 15m = -36 + 30$$

$$\Rightarrow 5m = -6$$

$$\Rightarrow m = -\frac{\mathbf{6}}{\mathbf{5}}$$

Word Problems

1. 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

$$\Rightarrow 5x - 68 = x \Rightarrow 5x - x = 68$$

$$4x = 68 \Rightarrow x = \frac{68}{4} = \mathbf{17}$$

2. 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, $3x + 64 = x + 142$

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

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

3. Let the number = x

Other number is 12 more than that number = $x + 12$

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

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

$$\Rightarrow 2x = 48 - 12 = 36$$

$$x = \frac{36}{2} = \mathbf{18}$$

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

Thus, number are 18 and 30.

4. 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, $\frac{3x}{4} + 5 = \frac{4x}{5}$

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

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

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

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

$$\Rightarrow 2x = 38 - 2 = 36$$

$$x = \frac{36}{2} = \mathbf{18}$$

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

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

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

$$\Rightarrow 3x + 6 = 51$$

$$\Rightarrow 3x = 51 - 6$$

$$\Rightarrow x = \frac{45}{3} = \mathbf{15}$$

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

7. 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 = $\mathbf{12}$ years.

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

8. 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 = $\mathbf{15}$ m

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

Revision Exercise

1. (i) $x + 6 = 10$

We try several values of x and find the LHS and RHS.

x	LHS	RHS
0	$0 + 6 = 6$	10
2	$2 + 6 = 8$	10
4	$4 + 6 = 10$	10

Thus, for $x = 4$, LHS = RHS

Therefore, $x = 4$ is the solution of the equation.

(ii), (iii) Do yourself.

2. (i) $2m - 12 = 18 \Rightarrow 2m = 18 + 12$

$$2m = 30 \Rightarrow m = \frac{30}{2} = 15$$

(ii) $2x - 16 = 5x - 19 \Rightarrow 5x - 2x = -16 + 19$

$$3x = 3 \Rightarrow x = \frac{3}{3} \Rightarrow x = 1$$

(iii) $\frac{m}{4} + \frac{1}{2} = 5 \Rightarrow \frac{m}{4} = 5 - \frac{1}{2} \Rightarrow \frac{m}{4} = \frac{9}{2}$

$$m = \frac{9}{2} \times 4 \Rightarrow m = 9 \times 2 \Rightarrow m = 18$$

(iv), (v), (vi) Do yourself.

3. (i) $x - 5 = 7 \Rightarrow x = 7 + 5 \Rightarrow x = 12$

$x = 12$, Substituting the value of x in equation, we get

$$x - 5 = 7$$

$$12 - 5 = 7$$

$$7 = 7$$

Hence, verified $x = 12$ is solution of equation.

(ii), (iii), (iv), (v), (vi), (vii) Do yourself.

(viii) $3 - (2x + 4) = 7 - (x - 3) \Rightarrow 3 - 2x - 4 = 7 - x + 3$

$$-1 - 2x = 10 - x \Rightarrow -2x + x = 10 + 1 \Rightarrow -x = 11$$

$$\Rightarrow x = -11$$

$x = -11$, Substituting the value of x in equation, we get

$$3 - (2 \times -11 + 4) = 7 - (-11 - 3) \Rightarrow 3 + 18 = 7 + 14$$

Hence, verified $x = -11$ is the solution of equation.

(ix), (x), (xi) Do yourself.

(xii) $(2x + 3) - (5x + 2) = 8$

$$2x + 3 - 5x - 2 = 8$$

$$-3x = 8 - 1$$

$$x = \frac{7}{-3}$$

$x = \frac{-7}{3}$, substituting the value of x in equation

$$\left(2 \times \frac{-7}{3} + 3\right) - \left(5 \times \frac{-7}{3} + 2\right) = 8$$

$$\left(\frac{-14}{3} + 3\right) - \left(\frac{-35}{3} + 2\right) = 8$$

$$\frac{-5}{3} + \frac{29}{3} = 8$$

$$\frac{-5 + 29}{3} = 8$$

$$\frac{24}{3} = 8$$

$$8 = 8$$

Hence, verified $x = \frac{-7}{3}$ is the solution of the equation.

(xiii) Do yourself.

(xiv) $8(11 - x) - 7(3x - 2) = 15$

$$88 - 8x - 21x + 14 = 15$$

$$-29x = 15 - 102$$

$$x = \frac{-87}{-29} \Rightarrow x = 3$$

$x = 3$, Substituting the value of x in equation

$$8(11 - 3) - 7(3 \times 3 - 2) = 15$$

$$8 \times 8 - 7 \times 7 = 15$$

$$64 - 49 = 15 \Rightarrow 15 = 15$$

Hence, verified $x = 3$ is the solution of the equation.

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

Now $\frac{1}{5} \times x^\circ = \frac{1}{7} (36^\circ - x^\circ)$

or $\frac{x^\circ}{5} = \frac{36^\circ}{7} - \frac{x^\circ}{7}$

$$\Rightarrow \frac{x^\circ}{5} + \frac{x^\circ}{7} = \frac{36^\circ}{7} \Rightarrow \frac{7x^\circ + 5x^\circ}{35} = \frac{36^\circ}{7}$$

$$\Rightarrow 12x^\circ = 180^\circ \Rightarrow x^\circ = \frac{180^\circ}{12} = 15^\circ$$

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

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,

$$(x + 2)(x + 5) = 70 + x(x + 3)$$

$$x^2 + 7x + 10 = 70 + x^2 + 3x$$

$$4x + 10 = 70$$

$$x = \frac{60}{4} = \mathbf{15 \text{ cm}}$$

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,

$$\Rightarrow x + \frac{2}{5}x = 42$$

$$\Rightarrow \frac{5x + 2x}{5} = 42$$

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

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

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

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

8. Let the base angle = x°

$$\text{Now } x^\circ + x^\circ + 80^\circ = 180^\circ$$

$$2x^\circ + 80^\circ = 180^\circ$$

$$\Rightarrow 2x^\circ = 180^\circ - 80^\circ = 100^\circ$$

$$\Rightarrow x = \frac{100^\circ}{2} = 50^\circ$$

So, measure of base angle = $\mathbf{50^\circ}$.



8. Ratio and Proportion

Exercise 8.1

1. (i) Number of villages is 2000 times that of cities in India
(ii) Number of students passing an examination is $\frac{4}{5}$ of the number that appeared
(iii) Number of bad pencils produced in a factory is $\frac{1}{9}$ of the number of good pencils produced in the factory.
(iv) Quantity of acid in the diluted acid is $\frac{2}{5}$ of the water.
2. (i) Ratio of the number of classes to the number of teachers is 4 : 6
(ii) Ratio of length to breadth is 2 : 1
(iii) Ratio of the number of girls to that of boys in the merit list is 2 : 1
(iv) Ratio of the number of students passing a mathematics test to that of total students appearing in the test is 2 : 3
3. (i) $160000 : 12000 \Rightarrow \mathbf{40 : 3}$ (ii) $12000 : 160000 \Rightarrow \mathbf{3 : 40}$
4. Sachin's earning = ₹ 14000
His wife earning = ₹ 18000
 \therefore Total earning = ₹ (14000 + 18000) = ₹ 32000
(i) $14000 : 32000 \Rightarrow \mathbf{7 : 16}$
(ii) $18000 : 32000 \Rightarrow \mathbf{9 : 16}$
5. Neha's earning = ₹ 9550
Neha's 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 = $88 : 144 = \mathbf{11 : 18}$

Word Problems

1. $42 : 1.2 \times 100 \Rightarrow 42 : 120 \Rightarrow \mathbf{7 : 20}$
2.
$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$
$$\text{Speed of car} = \frac{135}{3} = 45 \text{ km/h}$$

$$\text{Speed of train} = \frac{170}{2} = 85 \text{ km/h}$$

$$\text{Ratio of their speeds} = \frac{45}{85} = 45 : 85 = \mathbf{9 : 17}$$

Exercise 8.2

1. (i) 7 : 20 (ii) 13 : 4 (iii) 19 : 10 (iv) 13 : 2

2. (i) 4 : 6 (ii) 9 : 10 (iii) 4 : 6

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) Do yourself.

Word Problems

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

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

So, Number of boys = $121 \times 5 = \mathbf{605}$

 Number of girls = $121 \times 3 = \mathbf{363}$

2. According to question, $3x + 7x = 1500$

$$10x = 1500 \Rightarrow x = 150$$

So, Amount that Divya get = $3 \times 150 = 450$

Amount that neha get = $7 \times 150 = 1050$

3. Do yourself.

4. Let Naman's age = x years

Naman's father age = $3x$

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

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

6. 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 8.3

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) Do yourself.

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) Do yourself.

3. (i) $20 \text{ cm} : 1 \text{ m} = \frac{20 \text{ cm}}{100 \text{ cm}} = \frac{1}{5} = 1 : 5$

$$3.5 \text{ m} : 17.5 \text{ m} = \frac{3.5 \text{ m}}{17.5 \text{ m}} = \frac{1}{5} = 1 : 5$$

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

So, the given ratio are from a proportion.

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

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) Do yourself.

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. (i) $32 \text{ m} : \square = 6 : 12$

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

Now product of extremes = $32\text{m} \times 12$

and product of means = $x \times 6$

According to question $32\text{ m} \times 12 = x \times 6$

$$x = \frac{32\text{ m} \times 12}{6} = 64\text{ m}$$

(ii) $2\text{ kg} : 26\text{ kg} = \square : 260\text{ m}$

$$\text{Let } \square = x \Rightarrow \frac{2\text{ kg}}{26\text{ kg}} = \frac{x\text{ m}}{260\text{ m}}$$

$$x = \frac{2 \times 260}{26} = 20\text{ m}$$

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

7. Do yourself.

8. (i) 25, 35, \square

Let $\square = x$

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

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

9. $9 \times x = 57 \times 57 \Rightarrow x = \frac{57 \times 57}{9}$

$$x = 19 \times 19 = 361$$

10. Do yourself.

Exercise 8.4

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

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

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

2. Cost of 36 post cards = $\frac{7.50}{15} \times 36 = ₹ 18$

3. Cost of 16 metres of cloth = $\frac{2550}{30} \times 16 = ₹ 1360$

4. Amount that should be paid to the worker for 28 days
= $\frac{560}{5} \times 28 = ₹ 3136$

5. Monthly consumption = $\frac{5200}{400} \times 260 = ₹ 3380$

6. Cost of 5 kg of rice = ₹ 130

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

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

7. Number of envelopes can be bought for ₹ 32 = $\frac{15}{60} \times 32 = 8$
8. Speed of a train = $\frac{85}{3/2} = \frac{170}{3}$ km/h
 Required time = $\frac{\text{Distance}}{\text{Speed}} = \frac{340}{\frac{170}{3}} = 6$ hrs
9. Number of parts manufactured by the machine in 24 hours
 = $\frac{24}{6} \times 24 = 96$ parts.
10. Number of chairs that can be loaded on a truck
 = $\frac{45}{18} \times 4000 = 10,000$
11. 280 quintals of wheat yield in = 6 hectares
 1 quintal of wheat yield in = $\frac{6}{280}$ hectares
 225 quintals of wheat yield in = $\frac{6 \times 225}{280} = \frac{135}{28}$ **hectares**
12. The rent to the room for a year = $\frac{4800}{4} \times 12 = ₹ 14400$
13. An aeroplane flies in 3 hours = $\frac{4000}{5} \times 3 = 2400$ km
14. Required diesel = $\frac{108}{594} \times 1650 = 300$ L
15. Required kilowatts of pumping set = $\frac{1.5}{1500} \times 4500 = 4.5$ kw
16. ₹ 19210 is the price of = 17 chairs
 ₹ 1 is the price of = $\frac{17}{19210}$ chairs
 ₹ 113000 is the price of = $\frac{17 \times 113000}{19210} = \mathbf{100}$ **chairs.**
17. Cost of 120 oranges = $\frac{60}{24} \times 120 = ₹ 300$
18. (i) Weight of 80 books = $\frac{9}{72} \times 80 = 10$ kg
 (ii) Do yourself.
19. (i) Time taken to travel 440 km = $\frac{3}{165} \times 440 = 8$ hours
 (ii) Distance travelled in 7 hours = $\frac{165}{3} \times 7 = 55 \times 7 = 385$ km

Revision Exercise

1. (i) Ratio of the number of boys to that of girls = $30 : 25 = 6 : 5$
(ii) Total number of student = $30 + 25 = 55$
Ratio of the number of girls to that of total number of students
= $25 : 55 = 5 : 11$

(iii) Do yourself.

2. Do yourself.

3. (i) $20 : 40 = \frac{20}{40} = \frac{1}{2}$

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

4. (i) $2.1 : 1.2 = \frac{2.1}{1.2} = \frac{7}{4} = 7 : 4$

(ii) $91 \text{ cm} : 1.04 \text{ m} = \frac{91}{1.04 \times 100} = \frac{91}{104} = \frac{7}{8} = 7 : 8$

(iii) $3.5 \text{ kg} : 250 \text{ g} = \frac{3.5 \times 1000}{250} = \frac{350}{25} = \frac{70}{5} = \frac{14}{1} = 14 : 1$

(iv), (v), (vi) 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. (i) $\frac{15}{25} = \frac{x}{30} \Rightarrow x = \frac{15 \times 30}{25} = 18$

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

7. (i) $30 \times x = 40 \times 40 \Rightarrow x = \frac{40 \times 40}{30} \Rightarrow x = \frac{160}{3}$

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

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

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

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

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

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

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

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

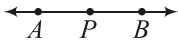
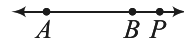
Thus, 10 bananas can be purchased.

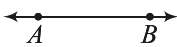


9. Basic Geometrical Ideas

Exercise 9.1

1. (i) \overleftrightarrow{PQ} only one (ii) Infinite (iii) Infinite

2. (i)  (ii) 
 P

(iii) 

3. (i) O, B, C, D, E (ii) \overleftrightarrow{DB} ; more answers are possible

(iii) $\overrightarrow{OC}, \overrightarrow{OB}, \overrightarrow{EB}, \overrightarrow{DB}$; more answers are possible.

(iv) $\overrightarrow{OB}, \overrightarrow{OC}, \overrightarrow{DE}, \overrightarrow{DO}, \overrightarrow{DB}$; more answers are possible

4. (i) A, D, C; B, D, E (ii) l, n, p ; point B and m, p, q ; point A

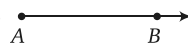
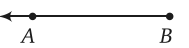
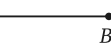
5. (i) \overleftrightarrow{AE} ; more answers are possible (ii) \overleftrightarrow{AE} (iii) \overleftrightarrow{OC}

(iv) $\overleftrightarrow{AE}, \overleftrightarrow{OC}; \overleftrightarrow{AE}, \overleftrightarrow{EF}$

6. (i) $l, m; l, n; m, n$

(ii) $l, p; m, p; n, p; l, q; m, q; n, q; l, r; m, r; n, r; p, q; p, r; q, r$

(iii) n, r, q (iv) A, B, C; A, H, I, D; D, E, F, G; C, I, E; B, H, F

7. (i)  (ii)  (iii) 

8. (i) intersecting (ii) parallel (iii) parallel (iv) intersecting

9. Unlimited number of lines

10. One

11. One

12. (i) $\overline{AB}, \overline{AC}, \overline{AD}, \overline{BC}, \overline{BD}$ and \overline{CD} ; six

(ii) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{AD}, \overline{AE}, \overline{AC}, \overline{EC}, \overline{BE}, \overline{BD}$ and \overline{ED} ; ten

(iii) $\overline{AB}, \overline{BC}, \overline{CD}, \overline{AD}, \overline{AE}, \overline{BE}, \overline{CE}$ and \overline{DE} ; eight

13. Lines $\overleftrightarrow{AB}, \overleftrightarrow{BC}$ and \overleftrightarrow{CA} ; three

14. (i) Rays $\overrightarrow{AB}, \overrightarrow{AC}, \overrightarrow{AD}, \overrightarrow{AE}; \overrightarrow{BC}, \overrightarrow{BD}, \overrightarrow{BA}, \overrightarrow{BE}; \overrightarrow{CD}, \overrightarrow{CB}, \overrightarrow{CA}, \overrightarrow{CE}$

(ii) No (iii) No (iv) Yes (v) Yes

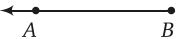
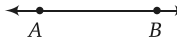

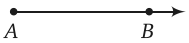
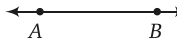

15. (i) True (ii) True (iii) True (iv) False (v) False (vi) False (vii) False

(viii) False

Exercise 9.2

- (i) Ten; line segments $AB, BC, CD, DA, AE, EB, EC, ED, AC$ and BD
(ii) Six; line segments AB, AC, BC, BD, CD and AD
(iii) Two; line segments AB and BC
(iv) Seven; line segments AB, BC, CD, DE, AC, AD and AE
- to 10. Do it yourself

Revision Exercise

- (i) False; a dot has no length and no width (ii) True (iii) False; a line segment PQ is just written as \overline{PQ} (iv) True (v) False; three points are said to be collinear if they lie in the same straight line (vi) True
- (i)  (ii)  (iii) 
- (i)  (ii)  (iii) 
- (i) Three (ii) None 5. Yes 6. (i) No (ii) Yes (iii) No (iv) No
- Do it yourself



10.

Angles

Exercise 10.1

- (i) Vertex Y , Arms YX and YZ
(ii) Vertex M , Arms MN and ML
(iii) Vertex P , Arms PQ and PR
(iv) Vertex B , Arms BA and BC
- Six; angles AOB, BOC, COD, AOC, BOD and AOD
- Do it yourself
- Do it yourself
- (i) Angle DAE or EAD
(ii) Angle BAC or CAB
(iii) Angle ACD or DCA
(iv) Angle ADC or CDA
(v) Angle AFE or EFA
- (i) No (ii) Yes (iii) Yes (iv) Yes (v) No
- Angles $BAD, ABD, ADB, BDC, DBC, DCB, ADC$ and ABC ; Two
- (i) Points A, D and F (ii) Points B and C (iii) Points P, G, Q, E and R

Exercise 10.2

1. 45°
2. (i) Yes (ii) No
3. (i) Obtuse (ii) Right (iii) Straight (iv) Reflex (v) Acute (vi) Acute
4. (i) South West (ii) North East
5. Right angle
6. (i) Acute (ii) Obtuse (iii) Acute (iv) Straight (v) Reflex
(vi) Complete (vii) Zero (viii) Right

Exercise 10.3

1. (i) Pairs of angles (1, 2), (2, 3), (3, 4), (4, 1), (5, 6), (6, 7), (7, 8), (8, 5) (ii) Pairs of angles (1, 3), (2, 4), (5, 7) and (6, 8)
2. (i) Yes (ii) No (iii) Yes (iv) Yes (v) Yes
3. (i) 35° (ii) 17° (iii) 45° (iv) 65° (v) 40°
4. No, because they do not have a common vertex
5. (i) Supplementary (ii) Supplementary (iii) Complementary
(iv) Complementary (v) Supplementary (vi) Complementary
(vii) Supplementary (viii) Complementary
6. Increase so that the sum of the two angles remains the same
7. (i) 110° (ii) 115° (iii) 135° (iv) 90° (v) 45°
8. Obtuse angle
9. (i) No (ii) No (iii) Yes
10. Less than 45°
11. (i) $y + 35^\circ = 180^\circ$ [Adjacent angles on a line]

$$y = 180^\circ - 35^\circ \Rightarrow y = 145^\circ$$

$$z = 35^\circ \text{ [Vertically opposite]}$$

$$x + z + 80^\circ = 180^\circ \text{ [Adjacent angles on a line]}$$

$$x = 180^\circ - 80^\circ - 35^\circ$$

$$x = 65^\circ$$

(ii) Do yourself.

Revision Exercise

1. Four; $\angle A$, $\angle B$, $\angle C$ and $\angle D$
2. (i) A (ii) A, D, C (iii) O, B, E, F
3. Draw yourself
4. (i) Yes (ii) No
5. (i) Straight (ii) Right (iii) Straight
6. Do it yourself
7. (i) Supplementary (ii) Supplementary (iii) Complementary
(iv) Complementary (v) Supplementary (vi) Supplementary
(vii) Complementary (viii) Supplementary
8. $x + x = 180^\circ \Rightarrow 2x = 180^\circ \Rightarrow x = 90^\circ$
9. $x + x = 90^\circ \Rightarrow 2x = 90^\circ \Rightarrow x = 45^\circ$



11. Pairs of Lines and Transversals

Exercise 11.1

- Only in fig (i), (iii) and (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 11.2

- 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 11.3

- $AB \parallel CD$

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

$$\angle CQP = \angle APR$$

(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)

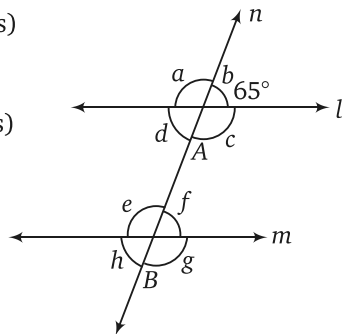
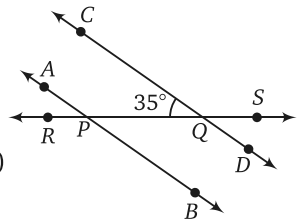
$$\therefore \angle h = 65^\circ$$

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

(Interior supplementary angles)

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

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



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

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

3. Do yourself.

4. (i) In figure, we have

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

(Interior supplementary angles) m

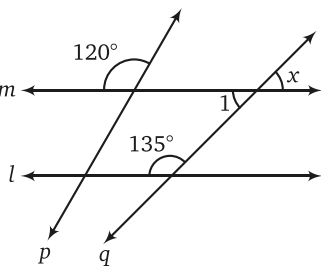
$$\angle 1 = 180^\circ - 135^\circ = 45^\circ$$

$$\angle 1 = \angle x$$

(Vertically opposite angles)

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

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



5. (i) $\angle BOD = \angle AOC$ [Vertically opposite angles]

$$\angle BOD = 50^\circ$$

(ii), (iii) Do yourself.

6. (i) $4x - 5^\circ = 3x + 15^\circ$ [Vertically opposite angles]

$$4x - 3x = 15^\circ + 5^\circ \Rightarrow x = 20^\circ$$

(ii) $\angle APD = 3x + 15^\circ = 3 \times 20^\circ + 15^\circ = 60^\circ + 15^\circ = 75^\circ$

(iii), (iv) Do yourself.

7. $3x - 20^\circ + 68^\circ = 180^\circ$ [Adjacent angles on a line]

$$3x + 48^\circ = 180^\circ \Rightarrow 3x = 180^\circ - 48^\circ \Rightarrow x = \frac{132^\circ}{3} = 44^\circ \Rightarrow x = 44^\circ$$

Revision Exercise

1. $\angle 1 + \angle 2 = 180^\circ$ [Adjacent angles on a line]

$$\angle 2 = 180^\circ - 120^\circ = 60^\circ$$

$$\angle 3 = \angle 1 \text{ [Vertically opposite angles]} \quad \angle 3 = 120^\circ$$

$$\angle 4 = \angle 2 \text{ [Vertically opposite angles]} \quad \angle 4 = 60^\circ$$

$$\angle 5 = \angle 7 \text{ [Corresponding angles]} \quad \angle 5 = 120^\circ$$

$$\angle 6 = \angle 2 \text{ [Corresponding angles]} \quad \angle 6 = 60^\circ$$

$$\angle 7 = \angle 3 \text{ [Corresponding angles]} \quad \angle 7 = 120^\circ$$

$$\angle 8 = \angle 4 \text{ [Corresponding angles]} \quad \angle 8 = 60^\circ$$

2. to 4. Do yourself.

5. (i) $\angle AOB + \angle BOC = 90^\circ - x + 90^\circ + x = 180^\circ$

So, $\angle AOB$ and $\angle BOC$ are adjacent angles.

(ii), (iii) Do yourself.

6. $\angle APB$ and $\angle APC$ are adjacent angles.

$$\angle APB + \angle APC = 180^\circ$$

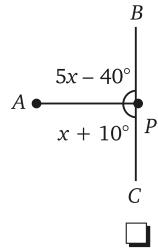
$$5x - 40^\circ + x + 10^\circ = 180^\circ$$

$$6x = 180^\circ + 30^\circ \Rightarrow x = \frac{210^\circ}{6}$$

$$x = 35^\circ$$

$$\angle APB = 5x - 40^\circ$$

$$= 5 \times 35^\circ - 40^\circ = 135^\circ$$



12.

Polygon

Exercise 12.1

- Do it yourself
- (i) Yes (ii) Yes (iii) Yes
- Open- (iii), (iv); Simple Closed- (v), (vi); Complex Closed - (i), (ii)
- The point A is neither in the exterior nor in the interior of $\triangle ABC$. In fact, the point A lies on the boundary of $\triangle ABC$
- (i) and (iii)
- (i) Yes (ii) Yes (iii) Its diagonals are \overline{AC} and \overline{BD} (iv) diagonal \overline{AC} is in the interior and diagonal \overline{BD} is in the exterior of quadrilateral $ABCD$
- (i) Quadrilateral (ii) Triangle (iii) Hexagon (iv) Octagon
- It has two diagonals; these are \overline{PR} and \overline{QS}
- (i) $\overline{KL}, \overline{MN}; \overline{LM}, \overline{NK}$ (ii) $\angle K, \angle M; \angle L, \angle N$ (iii) $\overline{KL}, \overline{LM}; \overline{LM}, \overline{MN}$ (iv) $\angle K, \angle L; \angle L, \angle M$
- (i) Closed (ii) 3 sided (iii) 5 sided (iv) Octagon
- (i) irregular (ii) regular (iii) regular (iv) regular

Exercise 12.2

- (i) Linear (ii) Curvilinear (iii) Linear
- Do it yourself
- (i) $n = 9$ sides
Sum of its interior angles
 $= (n - 2) \times 180^\circ = (9 - 2) \times 180^\circ = 1260^\circ$
(ii), (iii) Do yourself.
- (i) $(n - 2) \times 180^\circ = 1440^\circ$
 $(n - 2) = \frac{1440^\circ}{180^\circ} \Rightarrow n - 2 = 8$
 $n = 8 + 2 \Rightarrow n = 10$
(ii) Do yourself.

5. No,

6. (i) $\frac{(n-2)}{n} \times 180^\circ = \frac{(6-2) \times 180^\circ}{6} = 4 \times 30^\circ = 120^\circ$

(ii) Do yourself.

7. Do yourself.

8. $4x + 5x + 3x = 6x = 360^\circ$

$$18x = 360^\circ \Rightarrow x = 20^\circ$$

So, angles are $4 \times 20^\circ, 5 \times 20^\circ, 3 \times 20^\circ$ and $6 \times 20^\circ$.

$80^\circ, 100^\circ, 60^\circ, 120^\circ$

9. Number of sides $n = 5$

$$\text{Sum of its interior angles} = (n-2) \times 180^\circ$$

$$= (5-2) \times 180^\circ = 540^\circ$$

$$120^\circ + x + x + x + x = 540^\circ \Rightarrow 4x = 540^\circ - 120^\circ$$

$$x = \frac{420^\circ}{4} = 105^\circ$$

10. In case of regular polygon, with :

	Number of sides	Each exterior angle	Each interior angle
(i)	6	60°	120°
(ii)	8	45°	135°
(iii)	10	36°	144°
(iv)	18	20°	160°
(v)	8	45°	135°
(vi)	24	15°	165°

11. (i) $160^\circ; \frac{(n-2) \times 180^\circ}{n} = 160^\circ \Rightarrow (n-2) = \frac{160n}{180^\circ} = \frac{8n}{9}$

$$9(n-2) = 8n \Rightarrow 9n - 8n = 18 \Rightarrow n = 18$$

(ii) Do yourself.

12. (i) Each exterior angle = $\frac{360^\circ}{n} \Rightarrow 30^\circ = \frac{360^\circ}{n} \Rightarrow n = \frac{360^\circ}{30^\circ} \Rightarrow n = 12$

(ii) Do yourself

13. (i) Each interior angle = $\frac{(n-2) \times 180^\circ}{n} \Rightarrow 135^\circ = \frac{(n-2) \times 180^\circ}{n}$

$$\frac{n \times 135^\circ}{180^\circ} = n - 2 \Rightarrow 3n = 4(n - 2)$$

$$3n = 4n - 8 \Rightarrow 4n - 3n = 8 \Rightarrow n = 8$$

Yes, it is possible to have a regular polygon whose each interior angle is 135° .

(ii) Do yourself.

Revision Exercise

1. (i) Yes (ii) No (iii) Yes (iv) No
(v) No
2. (i) open (ii) open (iii) closed (iv) closed
3. Regular polygons have sides of equal length, whereas in irregular polygons all the sides are not equal.
4. $5x + 4x + 5x + 7x + 6x = 540^\circ$
 $27x = 540^\circ \Rightarrow x = 20^\circ$

So, angles of the pentagon,

$$5x = 5 \times 20^\circ = 100^\circ, 4x = 4 \times 20^\circ = 80^\circ, 5x = 5 \times 20^\circ = 100^\circ$$

$$7x = 7 \times 20^\circ = 140^\circ, 6x = 6 \times 20^\circ = 120^\circ$$

5. $90^\circ + 110^\circ + x + x + x + x = 720^\circ$
 $4x = 720^\circ - 200^\circ \Rightarrow x = \frac{520^\circ}{4}$
 $x = 130^\circ$

6. (i) Each exterior angle $= \frac{360^\circ}{n} \Rightarrow 100^\circ = \frac{360^\circ}{n}$
 $n = \frac{360^\circ}{100^\circ} = 3.6$

So, No, it is not possible to have a regular polygon whose each exterior angle is 100° .

(ii) Do yourself.

$$7. \frac{\text{Interior angle}}{\text{Exterior angle}} = \frac{2}{1} \Rightarrow \frac{\frac{(n-2) \times 180^\circ}{n}}{\frac{360^\circ}{n}} = \frac{2}{1}$$

$$\frac{(n-2)}{2} = \frac{2}{1} \Rightarrow n - 2 = 4 \Rightarrow n = 6$$

- (i) Each exterior angle $= \frac{360^\circ}{6} = 60^\circ$

(ii) Number of sides = 6

□

13.

Triangle

1. (i) Three (ii) Three (iii) Three (iv) Six
2. Triangle, $\triangle LMN$
3. (i) $\angle N$ (ii) LN (iii) M (iv) LM
4. No
5. Twelve; $\triangle ADE$, $\triangle ABE$, $\triangle ADC$, $\triangle ABC$, $\triangle BFC$, $\triangle BFD$, $\triangle BDE$, $\triangle CEF$, $\triangle CED$, $\triangle DEF$, $\triangle BCD$, $\triangle BEC$

6. (i) $\triangle ADE, \triangle ABE, \triangle ADC, \triangle ABC$
(ii) $\triangle BEA, \triangle BAC, \triangle BFC, \triangle BFD, \triangle BDE, \triangle BDC, \triangle BEC$
(iii) $\triangle CDA, \triangle CBA, \triangle CBF, \triangle CEF, \triangle CED, \triangle CBD, \triangle CBE$
(iv) $\triangle DAE, \triangle DAC, \triangle DBF, \triangle DBE, \triangle DEC, \triangle DEF, \triangle DBC$
(v) $\triangle EDA, \triangle EBA, \triangle EBD, \triangle ECF, \triangle ECD, \triangle EFD, \triangle EBC$
(vi) $\triangle FBC, \triangle FEC, \triangle FED, \triangle FDB$
7. $\triangle ADE, \triangle ADC, \triangle CEF, \triangle CED, \triangle DEF, \triangle ABC, \triangle ABE, \triangle DEA, \triangle DAC, \triangle DBF, \triangle DBE, \triangle DEC, \triangle DBC$
8. Points P, Q, R, G, A, D and $C; P, Q, R, G, A$ and D
9. (i) 38° (ii) $a = 95^\circ, b = 50^\circ$ (iii) 55°
10. (i) Acute \triangle (ii) Obtuse \triangle (iii) Right \triangle
(iv) Obtuse \triangle (v) Right \triangle (vi) Acute \triangle
11. (i) Isosceles \triangle (ii) Scalene \triangle (iii) Scalene \triangle
(iv) Scalene \triangle (v) equilateral \triangle
12. (i) Right \triangle (ii) Obtuse \triangle (iii) Acute \triangle
(iv) Obtuse \triangle (v) Right \triangle (vi) Acute \triangle
13. (i) Isosceles \triangle (ii) Equilateral \triangle (iii) Scalene \triangle
(iv) Scalene \triangle (v) Equilateral \triangle (vi) Isosceles \triangle
14. (i) Since $4 + 5 > 6, 5 + 6 > 4, 4 + 6 > 5$
Therefore 4, 5 and 6 could be possible lengths of the sides of a triangle.
(ii) Since $7 + 11 > 13, 7 + 13 > 11$ and $11 + 13 > 7$
Therefore 7, 11 and 13 could be possible lengths of the sides of a triangle.
(iii), (iv), (v) and (vi) Do yourself.
15. (i) Since $50^\circ + 95^\circ + 43^\circ = 188^\circ \neq 180^\circ$
Therefore $50^\circ, 95^\circ$ and 43° Could not be possible angles of a triangle.
(ii) Since $43^\circ + 37^\circ + 100^\circ = 180^\circ$
Therefore $43^\circ, 37^\circ$ and 100° Could be possible angles of a triangle.
(iii), (iv), (v) and (vi) Do yourself.
16. (i) Let the third angle be x .
 $30^\circ + 60^\circ + x = 180^\circ \Rightarrow x = 180^\circ - 90^\circ = 90^\circ$
(ii), (iii) and (iv) Do yourself.
17. Let the other two angles be $\angle A$ and $\angle B$.
According to question, $\angle C = \angle A + \angle B \dots$ (i)
We know that, $\angle A + \angle B + \angle C = 180^\circ$
 $\angle C + \angle C = 180^\circ \Rightarrow 2\angle C = 180^\circ \Rightarrow \angle C = \frac{180^\circ}{2} = 90^\circ$
18. Let the three angles of a triangle are x, y and z .
Then, $x = y = z$
 $\therefore x + y + z = 180^\circ$

10. Do yourself.

11. (i) $\angle ABC$ (ii) $\angle ABC + \angle ACB$ (iii) $\angle BAC + \angle ACB$

12. $\angle ACD = \angle ABC + \angle BAC$ [Exterior angles property]

$$\angle ACD = 60^\circ + 50^\circ = 110^\circ$$

13. (i) False (ii) False (iii) False (iv) True



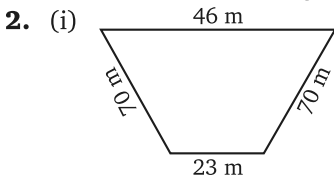
14. Perimeter and Area

Exercise 14.1

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

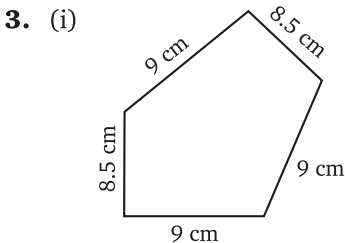
(ii), (iii) Do yourself.

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



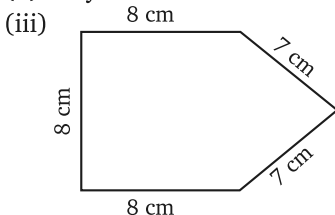
Perimeter of the given figure = $(46 + 23 + 70 + 70) \text{ m} = \mathbf{209 \text{ m}}$

(ii), (iii) Do yourself.



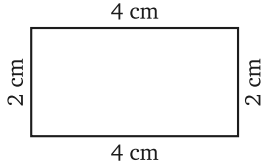
Perimeter of the given figure = $(9 + 9 + 9 + 8.5 + 8.5) \text{ cm} = \mathbf{44 \text{ cm}}$

(ii) Do yourself.



Perimeter of the given figure = $(8 + 8 + 8 + 7 + 7) \text{ cm} = \mathbf{38 \text{ cm}}$

4. (i)



$$\begin{aligned}\text{Perimeter of rectangle} &= \text{Sum of four side} \\ &= (4 + 4 + 2 + 2) \text{ cm} = \mathbf{12 \text{ cm}}\end{aligned}$$

(ii), (iii) Do yourself.

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
 $= (0.2 \text{ m} + 15 \text{ m} + 0.2 \text{ m} + 15 \text{ m})$
 $= \mathbf{30.4 \text{ m}}$

7. (i) Perimeter of rectangle = $2 \times (l + b)$
 $= 2 \times (5 + 4) = 2 \times 9 = \mathbf{18 \text{ cm}}$

(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
 $100 = 4 \times \text{side} \Rightarrow \frac{100}{4} = \text{side}$
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 = $\mathbf{15 \text{ cm}}$

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

Word Problems

1. Perimeter of rectangular park = $2 \times (l + b)$
 $= 2 \times (300 + 200) = 1000 \text{ m}$
 \therefore Cost of fencing a park = ₹ $1000 \times 24 =$ ₹ **24000**
2. 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.
3. 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 = ₹ $20 \times 1200 =$ ₹ **24000**
Thus, cost of fencing is ₹ 24000.
4. Perimeter of square = $4 \times \text{side} = 4 \times 75 = 300 \text{ m}$
Distance covered in three times by Parul = $300 \times 3 =$ **900 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 = $2 \times 530 =$ **1060 m**
Aman covers more distance = $1060 \text{ m} - 900 \text{ m} =$ **160 m**.
Thus, **Aman** covers 160 m more distance by Parul.

Exercise 14.2

1. (i) Area of rectangle = length \times breadth = $4 \text{ cm} \times 1 \text{ cm} =$ **4 cm^2**
(ii), (iii) Do yourself.
2. (i) Area of rectangle = length \times breadth
 $= 24 \text{ cm} \times 10 \text{ cm} =$ **240 cm^2**
(ii), (iii), (iv) Do yourself.
3. (i) Area of rectangle = length \times breadth
 $= 11 \text{ cm} \times 7 \text{ cm} =$ **77 cm^2**
(ii) Do yourself.
4. (i) Area of square = (side)² = $(11)^2 =$ **121 cm^2**
(ii) Do yourself.
5. (i) Area of rectangle = $l \times b = 24 \times 16 = 384 \text{ cm}^2$
(ii) Area of square = (Side)² = $(21)^2 = 441 \text{ cm}^2$
Square has larger area = $441 - 384 =$ **57 cm^2**
6. (i) Area of rectangle = length \times breadth
 $= 2l \times b =$ **$2lb$ (doubled)**
(ii) $l \times b = lb = l \times 2b =$ **$2lb$ (doubled)**
(iii) $l \times b = 2l \times 2b =$ **$4lb$ (four times)**
7. (i) Area of square = (side)² = $(2x)^2 =$ **$4x^2$**
Area will get **four times** than original area.
(ii) Area of square = $(3x)^2 =$ **$9x^2$**
Area will get **nine times** than original area.

$$(iii) \text{ Area of square} = \left(\frac{1}{2}x\right)^2 = \frac{1}{4}x^2$$

Area will get **one-fourth times** than original area.

Word Problems

- 1 cm = 10 mm, $1 \text{ cm}^2 = 1 \text{ cm} \times 1 \text{ cm} = 10 \text{ mm} \times 10 \text{ mm}$
= **100 mm²**
- 1 m = 100 cm, $1 \text{ m}^2 = 1 \text{ m} \times 1 \text{ m} = 100 \text{ cm} \times 100 \text{ cm} = \mathbf{10000 \text{ cm}^2}$
- Area of square = Area of rectangle $\Rightarrow 16^2 = 64 \times \text{breadth}$
 $\therefore \text{breadth} = \frac{16 \times 16}{64} = \frac{16}{4} = \mathbf{4 \text{ cm}}$
4. Do yourself.

Revision Exercise

- (i) Perimeter of the given closed figures = $2 \times (5 + 15 + 10 + 25)$
= $2 \times 55 = 110 \text{ cm}$
(ii) Do yourself.
- (i) Perimeter of rectangle = $2(l + b) = 2(40 + 35) = 150 \text{ cm}$
(ii), (iii), (iv) Do yourself.
- Perimeter of square = $5 \text{ m} = 500 \text{ cm}$
 $4 \times \text{side} = 500 \text{ cm} \Rightarrow \text{Side} = 125 \text{ cm or } 1.25 \text{ m}$
- Side of square field = 70 m
Perimeter of square field = $4 \times \text{side} = 4 \times 70 = 280 \text{ m}$
Length of rectangular field = 50 m
Breadth of rectangular field = 40 m
Perimeter of rectangular park = $2(l + b) = 2(50 + 40) = 180 \text{ m}$
 $280 \text{ m} > 180 \text{ m}$
Difference of perimeter = $280 \text{ m} - 180 \text{ m} = \mathbf{100 \text{ m}}$
Thus, perimeter of square field is 100 m more than rectangular field.
- Side of regular pentagon = 12 cm
Perimeter of regular pentagon = $5 \times \text{side} = 5 \times 12 = 60 \text{ cm}$
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 .
- Side of a square = 45 cm
Perimeter of square = $4 \times \text{side} = 4 \times 45 = 180 \text{ cm}$
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

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

Thus, area of the square is 51.84 cm^2 .

- (ii) Side of the square = 4.5 m

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

Thus, area of the square is 20.25 m^2 .

- (iii) Side of the square = 4.1 cm

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

Thus, area of the square is 16.81 cm^2 .

8. Side of a square = 7 m

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

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 m^2 area increases.

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

10. Area of rectangular piece of paper = 24 cm^2

Length of rectangular piece of paper = 5 cm

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

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

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

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

$$\text{Increased length of rectangle} = 30 + 10 = 40 \text{ m}$$

$$\text{Increased breadth of rectangle} = 20 \times 2 = 40 \text{ m}$$

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

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

Thus, area increased by 1000 m^2 .



15.

Data Handling

Exercise 15.1

1. (i)

Name of fruit	Tally marks	Number of times (Frequency)
Banana		8
Apple		5
Guava		4
Orange		3

(ii) Banana (iii) Orange

2. 32, 32, 34, 34, 34, 36, 36, 36, 38, 38, 38, 38, 38, 40, 40, 40, 40, 40, 42, 42, 42, 42, 42, 44, 44, 44

Size of shirts	Tally marks	Number of shirts (Frequency)
32		2
34		3
36		4
38		5
40		7
42		6
44		3

(i) 40 (ii) 32 (iii) 9

3. (i)

Marks obtained	Tally marks	Number of students (Frequency)
1		2
2		3
3		3
4		7
5		6
6		7
7		5
8		4
9		3

(ii) 12 (iii) 8

Exercise 15.2

1. (i) City D (ii) City C (iii) 3 (iv) 28
2. (i) V and VIII
(ii) No
(iii) Number of boys in class VII = $3 \times 4 = 12$
3. (i) Rajesh
(ii) Basket sold by sanjay = $100 \times 7.5 = 750$
(iii) Rajesh, Sanjay and Jasmeet

Revision Exercise

1.

Marks obtained	Tally marks	Number of students (Frequency)
2		1
4		2
5		6
6		3
8		1
10		9
12		1
15		4
16		2
17		2
18		5
19		3
20		6

2. Do yourself.

3. (i) Baskets sold by Rajesh = $4 \times 5 = 20$
(ii) Baskets sold by Naman = $8 \times 5 = 40$
(iii) Sachin and Sandeep
(iv) Rajesh



Model Text Paper-I

- Length of both the perimeter = $750\text{ m } 80\text{ cm} + 378\text{ m } 70\text{ cm}$
 $= 1129\text{ m } 50\text{ cm}$ or 112950 cm
- (i) Multiple of 12 = 48, 60, 72, 84, 96
(ii) Multiple of 19 = 57, 76, 95
(iii), (iv) Do yourself.
- 7, 13, 19; Difference between two consecutive factors is 6.
- $x = y + 1$ [$\because x$ is successor of y]
 $x - y + 2 = y + 1 - y + 2 = 3$
- Let the other integer be x .
$$x = \frac{-1495}{-23} = 65$$
- There are 11 natural numbers between 87 to 97
Prime number = 89, 97
Practition = $\frac{2}{11}$
- (i) First four equivalent fractions of $\frac{3}{7} = \frac{3 \times 2}{7 \times 2}, \frac{3 \times 3}{7 \times 3},$
 $\frac{3 \times 4}{7 \times 4}, \frac{3 \times 5}{7 \times 5} = \frac{6}{14}, \frac{9}{21}, \frac{12}{28}, \frac{15}{35}$
(ii), (iii), (iv) Do yourself.
- (i) $\frac{1}{4}$ of $2\frac{2}{7} \div \frac{3}{5} = \frac{1}{4} \times \frac{16}{7} \div \frac{3}{5} = \frac{1}{4} \times \frac{16}{7} \times \frac{5}{3} = \frac{20}{21}$
(ii), (iii), (iv) Do yourself.
- Part of journey still remain = $\frac{1}{4}$
Part of journey covered = $1 - \frac{1}{4} = 3/4$
In $\frac{3}{4}$ part of journey travelled = 15 km
1 part of journey travelled = $\frac{15}{3/4}$ km = 20 km
- (i) ₹ 63.22 – ₹ 35.74 = ₹ 27.48
(ii), (iii) Do yourself.
- Total length of the cloth bought by lipika.
 $= 2\text{ m } 70\text{ cm} + 2\text{ m } 85\text{ cm}$
 $= 5\text{ m } 55\text{ cm}$ or 555 cm
- Distance covered by bird in t minutes = $1.2t$ km
- (i) Numerical coefficient of $-5x^2y = -5$
(ii), (iii), (iv) Do yourself.

14. Let the breadth of rectangle = x m

$$\text{Length of rectangle} = (x + 10) \text{ m}$$

$$\text{Perimeter of rectangle} = 2(l + b)$$

$$80 = 2(x + 10 + x)$$

$$2x + 10 = \frac{80}{2} = 40$$

$$2x = 40 - 10 \Rightarrow x = \frac{30}{2}$$

$$x = 15 \text{ m}$$

$$\text{Breadth} = 15 \text{ m, length} = 15 + 10 = 25 \text{ m}$$



Model Text Paper-II

1. According to question, $5x + 3x = 968 \Rightarrow x = \frac{968}{8} = 121$

$$\text{So, Number of boys} = 121 \times 5 = 605$$

$$\text{Number of girls} = 121 \times 3 = 363$$

2. Product of extremes = $9 \times x$

$$\text{Product of means} = 57 \times 57$$

$$9 \times x = 57 \times 57$$

$$\Rightarrow x = \frac{57 \times 57}{9} = 19 \times 19$$

$$x = 361$$

3. An aeroplane flies in 3 hour = $\frac{4000}{5} \times 3 = 2400$ km

4. Do yourself.

5. Do yourself.

6. $\angle AOB + \angle AOC = 180^\circ$ [Adjacent angles on a line]

$$68^\circ + 3x - 20^\circ = 180^\circ$$

$$3x = 180^\circ - 48^\circ$$

$$\Rightarrow x = \frac{132^\circ}{3} = 44^\circ$$

7. $\angle APB + \angle APC = 180^\circ$ [Adjacent angles on a line]

$$5x - 40^\circ + x + 10^\circ = 180^\circ$$

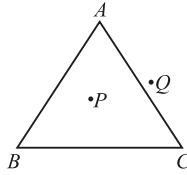
$$\Rightarrow 6x = 180^\circ + 30^\circ$$

$$\Rightarrow x = \frac{210^\circ}{6} = 35^\circ$$

$$\angle APB = 5 \times 35^\circ - 40^\circ$$

$$= 175^\circ - 40^\circ = 135^\circ$$

8. The point A is neither in the exterior nor in the interior of $\triangle ABC$.
In fact, the point A lies on the boundary of $\triangle ABC$.



9. (i) Sum of interior angles = $(n - 2) \times 180^\circ = (9 - 2) \times 180^\circ = 1260^\circ$
(ii), (iii) Do yourself.
10. Sum of the angles of triangle = $180^\circ \Rightarrow 160^\circ + x + x = 180^\circ$
 $2x = 180^\circ - 160^\circ \Rightarrow x = \frac{20^\circ}{2} = 10^\circ$
11. (i) Perimeter of the rectangle = $2(l + b) = 2(5 + 4) \text{ cm} = 18 \text{ cm}$
(ii), (iii) Do yourself.
12. Area of square = Area of rectangle
 $(16)^2 = 64 \times \text{breadth}$
 $\text{Breadth} = \frac{16 \times 16}{64} = 4 \text{ cm}$
13. Area of rectangular piece of paper = $24 \text{ cm}^2 \Rightarrow 5 \times \text{breadth} = 24$
 $\text{Breadth} = \frac{24}{5} = 4.8 \text{ cm}$
Perimeter of rectangular piece = $2(l + b) = 2(5 + 4.8) = 19.6 \text{ cm}$
14. (i)

Name of fruit	Tally marks	Number of times (Frequency)
Banana		8
Apple		5
Guava		4
Orange		3

- (ii) Banana (iii) Orange

