CHAPTER 12

VI-MATHEMATICS-NCERT-2023-24

12 .RATIO AND PROPORTION(Notes)

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1. We compare the two quantities in terms of 'how many times'. This comparison is known as the Ratio. We denote ratio using symbol ':'(is to)
2. Two quantities can be compared only if they are in the same unit.
3. The ratio of two quantities a to b is $a: b = \frac{a}{b}$

Try These

1. In a class, there are 20 boys and 40 girls. What is the ratio of the number of boys to the number of girls?

Sol: The ratio of boys to girls $= 20: 40 = \frac{\cancel{20}}{\cancel{40}} = \frac{1}{2} = 1: 2$

2. Ravi walks 6 km in an hour while Roshan walks 4 km in an hour. What is the ratio of the distance covered by Ravi to the distance covered by Roshan?

Sol: The ratio of the distance covered by Ravi to the distance covered by Roshan

$= 6: 4$

$= \frac{6}{4}$

$= \frac{3}{2}$

$= 3: 2$

3. Saurabh takes 15 minutes to reach school from his house and Sachin takes one hour to reach school from his house. Find the ratio of the time taken by Saurabh to the time taken by Sachin.

Sol: The ratio of the time taken by Saurabh to the time taken by Sachin $=$ 15 minutes: 1 hour

$= 15$ minutes: 60 minutes $= \frac{15}{60} = \frac{1}{4} = 1: 4$

1 hour=60 minutes

4. Cost of a toffee is 50 paise and cost of a chocolate is ₹ 10. Find the ratio of the cost of a toffee to the cost of a chocolate.

Sol: The cost of a toffee: The cost of a chocolate

1 rupee=100 paise

$= 50$ paise: 10 rupees

$= 50$ paise: 1000 paise

$= \frac{50}{1000} = \frac{1}{20} = 1: 20$

5. In a school, there were 73 holidays in one year. What is the ratio of the number of holidays to the number of days in one year?

Sol: The ratio of the number of holidays to the number of days in one year

$$= 73:365 = \frac{73}{365} = \frac{1}{5} = 1:5$$

Example 1 : Length and breadth of a rectangular field are 50 m and 15 m respectively. Find the ratio of the length to the breadth of the field.

Sol: Length=50 m , Breadth=15 m

The ratio of the length to the breadth $= 50:15 = \frac{50}{15} = \frac{10}{3} = 10:3$

$\therefore$ Required ratio=10:3

Example 2 : Find the ratio of 90 cm to 1.5 m.

Sol: 1 m=100 cm

1.5 m=1.5 × 100 cm = 150 cm

Required ratio $= 90:150 = \frac{\cancel{90}}{\cancel{150}} = \frac{3}{5} = 3:5$

Example 3 : There are 45 persons working in an office. If the number of females is 25 and the remaining are males, find the ratio of: (a) The number of females to number of males. (b) The number of males to number of females.

Sol : Total number of workers = 45

Number of females = 25

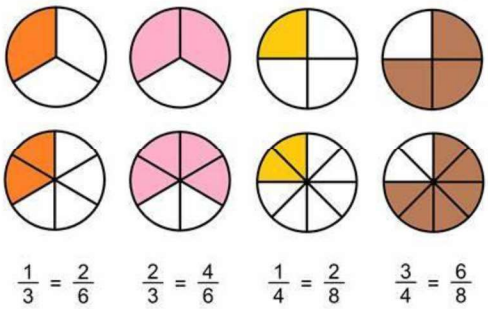
Number of males = 45 – 25 = 20

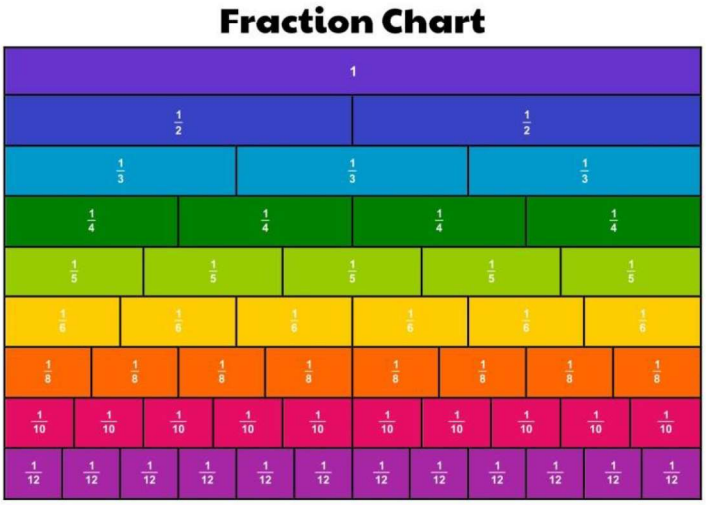
(a)The ratio of number of females to the number of males = 25 : 20 = 5 : 4

(b) The ratio of number of males to the number of females = 20 : 25 = 4 : 5.

Equivalent ratio:

We can get equivalent ratios by multiplying or dividing the numerator and denominator by the same number.





Example 4 : Give two equivalent ratios of 6 : 4.

Sol: $6:4 = \frac{6}{4} = \frac{6\times 2}{4\times 2} = \frac{6\times 3}{4\times 3} = \frac{6\times 4}{4\times 4}$

$6:4 = \frac{6}{4} = \frac{12}{8} = \frac{18}{12} = \frac{24}{16}$

$6:4 = 12:8 = 18:12 = 24:16$

Example 5 : Fill in the missing numbers :

$\frac{14}{21} = \frac{\square}{3} = \frac{6}{\square}$

Sol: $\frac{14}{21} = \frac{14\div 7}{21\div 7} = \frac{2}{3}$

$\frac{2}{3} = \frac{2\times 3}{3\times 3} = \frac{6}{9}$

$\frac{14}{21} = \frac{\boxed{2}}{3} = \frac{6}{\boxed{9}}$

Example 6 : Ratio of distance of the school from Mary's home to the distance of the school from John's home is 2 : 1. (a) Who lives nearer to the school? (b) Complete the following table which shows some possible distances that Mary and John could live from the school.

Distance from Mary's home to school (in km.)	10		4		
Distance from John's home to school (in km.)	5	4		3	1

(c) If the ratio of distance of Mary's home to the distance of Kalam's home from school is 1 : 2, then who lives nearer to the school?

Sol: $2:1 = \frac{2}{1} = \frac{2\times 2}{1\times 2} = \frac{2\times 3}{1\times 3} = \frac{2\times 4}{1\times 4} = \frac{2\times 5}{1\times 5}$

$\frac{2}{1} = \frac{4}{2} = \frac{6}{3} = \frac{8}{4} = \frac{10}{5}$

Distance from Mary's home to school (in km.)	10	8	4	6	2
Distance from John's home to school (in km.)	5	4	2	3	1

(c) Since the ratio is 1 : 2, so Mary lives nearer to the school.

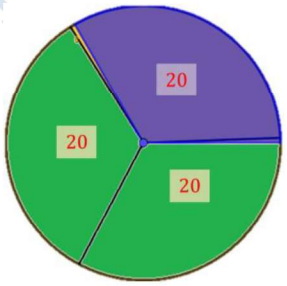
Example 7 : Divide ₹ 60 in the ratio 1 : 2 between Kriti and Kiran.

Sol: Ratio=1:2

Total parts=1+2=3

Kriti's share $= \frac{1}{3}\times 60 = ₹\,20$

Kiran's share $= \frac{2}{3}\times 60 = ₹\,40.$



EXERCISE 12.1

1. **There are 20 girls and 15 boys in a class.**
(a) What is the ratio of number of girls to the number of boys? (b) What is the ratio of number of girls to the total number of students in the class?

Sol: Number of girls=20

Number of boy=15

Total number of students=20+15=35

(a) The ratio of girls to boys=20:15=4:3

(b) The ratio girls to the total number of students in the class=20:35=4:7

2. **Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of**
(a) Number of students liking football to number of students liking tennis. (b) Number of students liking cricket to total number of students.

Sol: Total number of students=30

Football=6, Cricket=12

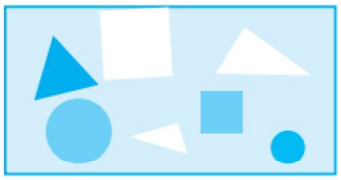
Tennis=30-(6+12)=30-18=12

(a) The ratio of number of students liking football to number of students liking tennis=6:12=1:2

(b) The ratio of number of students liking cricket to total number of students=12:30=2:5

3. See the figure and find the ratio of

Number of triangles=3, Number of squares=2, number of circles=2,
Number of all figures=3+2+2=7



(a) Number of triangles to the number of circles inside the rectangle.

Sol: The ratio of triangles to circles=3:2

(b) Number of squares to all the figures inside the rectangle.

Sol: The ratio of squares to all the figures=2:7

(c) Number of circles to all the figures inside the rectangle.

Sol: The ratio of circles to all the figures=2:7

4. Distances travelled by Hamid and Akhtar in an hour are 9 km and 12 km. Find the ratio of speed of Hamid to the speed of Akhtar.

Sol: Speed of Hamid $= \frac{\text{Diatance}}{\text{Time}} = \frac{9\text{ km}}{1\text{ h}} = 9\text{km/h}$

Speed of Akhtar $= \frac{\text{Diatance}}{\text{Time}} = \frac{12\text{ km}}{1\text{ h}} = 12\text{ km/h}$

The ratio of speed of Hamid to the speed of Akhtar=9:12=3:4

5. Fill in the following blanks:

$\frac{15}{18} = \frac{\quad}{6} = \frac{10}{\quad} = \frac{\quad}{30}$ **[Are these equivalent ratios?]**

Sol: $\frac{15}{18} = \frac{15 \div 3}{18 \div 3} = \frac{5 \times 2}{6 \times 2} = \frac{5 \times 5}{6 \times 5}$

$\frac{15}{18} = \frac{5}{6} = \frac{10}{12} = \frac{25}{30}$

Are these equivalent ratios?

Sol: Yes, these are equivalent ratios.

6. Find the ratio of the following :

(a) 81 to 108 (b) 98 to 63 (c) 33 km to 121 km (d) 30 minutes to 45 minutes.

Sol: (a) $81:108 = \frac{81}{108} = \frac{9}{12} = \frac{3}{4} = 3:4$

(b) $98:63 = \frac{98}{63} = \frac{14}{9} = 14:9$

(c) $33:121 = \frac{33}{121} = \frac{3}{11} = 3:11$

(d) $30:45 = \frac{30}{45} = \frac{6}{9} = \frac{2}{3} = 2:3$

7. Find the ratio of the following:

(a) 30 minutes to 1.5 hours

Sol: 1.5 hours=1.5×60 minutes=90 minutes
Required ratio=30:90=1:3

(b) **40 cm to 1.5 m**

Sol: 1.5 m=1.5×100 cm=150 cm
Required ratio=40:150=4:15

(c) **55 paise to ₹1**

Sol: ₹1=100 paise
Required ratio=55:100=11:20

(d) **500 mL to 2 litres**

Sol: 2 litres=2×1000 mL=2000 mL
Required ratio=500:2000=5:20=1:4

8. **In a year, Seema earns ₹ 1, 50, 000 and saves ₹ 50,000. Find the ratio of (a) Money that Seema earns to the money she saves. (b) Money that she saves to the money she spends.**

Sol: Money earned by Seema=₹ 1,50,000

Money saved by Seema=₹50,000

Money spent by Seema=₹1,50,000-₹ 50,000=₹1,00,000

(a)The ratio of money earns to money saves $= 1,5\cancel{0,000}:5\cancel{0,000} = 15:5 = 3:1$

(b)The ratio of money saves to money spends $= 5\cancel{0,000}:1,0\cancel{0,000} = 5:10 = 1:2$

9. **There are 102 teachers in a school of 3300 students. Find the ratio of the number of teachers to the number of students.**

Sol: Number of teachers=102

Number of students=3300

The ratio of teachers to students $= 102:3300(\div 6) = 17:550$

10. **In a college, out of 4320 students, 2300 are girls. Find the ratio of**
(a) Number of girls to the total number of students. (b) Number of boys to the number of girls. (c) Number of boys to the total number of students.

Sol: Number of students=4320

Number of girls=2300

Number of boys=4320-2300=2020

(a)Ratio of number of girls to the total number of students=230$\cancel{0}$:432$\cancel{0}$ = 230:432=115:216

(b) Ratio of number of boys to the number of girls=202$\cancel{0}$:230$\cancel{0}$=202:230=101:115

(c) Ratio of number of boys to the total number of students=202$\cancel{0}$:432$\cancel{0}$=202:432=101:216

11. . **Out of 1800 students in a school, 750 opted basketball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of**

(a) Number of students who opted basketball to the number of students who opted table tennis. (b) Number of students who opted cricket to the number of students opting basketball. (c) Number of students who opted basketball to the total number of students.

Sol: Total number of students=1800

Number of students opted basketball=750

Number of students opted cricket=800

Number of students opted table tennis=1800-750-800=1800-1550=250

(a) Ratio of students opted basketball to students opted table tennis=75~~0~~:25~~0~~=75:25=3:1

(b) Ratio of students opted cricket to students opted basketball =80~~0~~:75~~0~~=80:75=16:15

(a) Ratio of students opted basketball to total number of students
=75~~0~~:180~~0~~=75:180=15:36=5:12

12. Cost of a dozen pens is ₹ 180 and cost of 8 ball pens is ₹ 56. Find the ratio of the cost of a pen to the cost of a ball pen.

Sol: Cost of 12 pens =₹ 180

$$\text{Cost of a pen} = \frac{180}{12} = ₹15$$

Cost of 8 ball pens = ₹ 56

$$\text{Cost of a ball pen} = \frac{56}{8} = ₹7$$

The ratio of the cost of a pen to the cost of a ball pen=15:7

13. Consider the statement: Ratio of breadth and length of a hall is 2 : 5. Complete the following table that shows some possible breadths and lengths of the hall.

Sol: Ratio of breadth and length of a hall=2:5

$$2:5 = \frac{2}{5} = \frac{2\times5}{5\times5} = \frac{2\times10}{5\times10} = \frac{2\times20}{5\times20}$$

$$2:5 = \frac{2}{5} = \frac{10}{25} = \frac{20}{50} = \frac{40}{100}$$

Breadth of the hall (in metres)	10	20	40
Length of the hall (in metres)	25	50	100

14. Divide 20 pens between Sheela and Sangeeta in the ratio of 3 : 2.

Sol: Ratio of Sheela to Sangeeta=3:2

Total parts=3+2=5

Total pens=20

Number of pens to Sheela $= \frac{3}{\cancel{5}} \times \cancel{20}^{4} = 3 \times 4 = 12$

Number of pens to Samgeeta $= \frac{2}{\cancel{5}} \times \cancel{20}^{4} = 2 \times 4 = 8$

15. Mother wants to divide ₹ 36 between her daughters Shreya and Bhoomika in the ratio of their ages. If age of Shreya is 15 years and age of Bhoomika is 12 years, find how much Shreya and Bhoomika will get.

Sol: Ratio of Shreya's age to Bhoomika's age=15:12=5:4

Total parts=5+4=9

Total money=₹ 36

Money that Shreya will get $= \frac{5}{\cancel{9}} \times \cancel{36}^{4} = 5 \times 4 = ₹20$

Money that Bhoomika will get $= \frac{4}{9} \times 36 = 4 \times 4 = ₹16$

16. Present age of father is 42 years and that of his son is 14 years. Find the ratio of
(a) Present age of father to the present age of son. (b) Age of the father to the age of son, when son was 12 years old. (c) Age of father after 10 years to the age of son after 10 years. (d) Age of father to the age of son when father was 30 years old.

Sol: Present age of father = 42 years

Present age of son = 14 years

(a) Ratio of present age of father to the present age of son=42:14=3:1

(b) When son was 12 years old , age of father =42-2=40 years

Ratio of Age of the father to the age of son, when son was 12 years old=40:12=10:3

(c) Ratio of age of father after 10 years to the age of son after 10 years =(42+10):(14+10)
=52:24=13:6

(c) When father was 30 years old, age of son=14-12=2 years

Ratio of age of father to the age of son when father was 30 years old.= 30:2=15:1

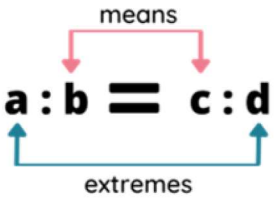
Proportion:

If two ratios are equal, we say that they are in proportion and use the symbol '::' or '=' to equate the two ratios.

If two ratios are not equal, then we say that they are not in proportion.

In a statement of proportion, the four quantities involved when taken in order are known as respective terms. First and fourth terms are known as extreme terms. Second and third terms are known as middle terms(means).

In **a : b : : c : d**; (**a** is to **b** as **c** is to **d**)a, b, c, d are the four terms.



a and **d** are the extreme terms. **b** and **c** are the middle terms.

Example 8 : Are the ratios 25g : 30g and 40 kg : 48 kg in proportion?

Sol: $25\ g : 30\ g = \frac{25}{30} = \frac{5}{6} = 5:6$

$40\text{ kg} : 48\text{ kg} = \frac{40}{48} = \frac{5}{6} = 5:6$

$25\ g : 30\ g = 40\ kg : 48\ kg$

$\therefore$ The ratios 25 g : 30 g and 40 kg : 48 kg are in proportion.

Example 9 : Are 30, 40, 45 and 60 in proportion?

Sol: $30 : 40 = \frac{30}{40} = 3:4$

$45 : 60 = \frac{45}{60} = \frac{3}{4}$

Since, 30 : 40 = 45 : 60.

Therefore, 30, 40, 45, 60 are in proportion.

Example 10 : Do the ratios 15 cm to 2 m and 10 sec to 3 minutes form a proportion?

Sol: $15\text{ cm} : 2\text{ m} = 15\text{ cm} : 200\text{ cm} = 15 : 200 = 3 : 40$

1 m=100 cm
1 min=60 sec

$10\text{ sec} : 3\text{ min} = 10\text{ sec} : 180\text{ sec} = 10 : 180 = 1 : 18$

Since, $3 : 40 \neq 1 : 18$

The given ratios do not form a proportion.

EXERCISE 12.2

1. **Determine if the following are in proportion.**

(a) 15, 45, 40, 120

Sol: $15 : 45 = \frac{15}{45} = \frac{1}{3} = 1:3$

$40 : 120 = \frac{40}{120} = \frac{1}{3} = 1:3$

$15 : 45 = 40 : 120$

15, 45, 40, 120 are in proportion

(b) 33, 121, 9,96

Sol: $33 : 121 = \frac{33}{121} = \frac{3}{11} = 3:11$

$9 : 96 = \frac{9}{96} = \frac{3}{32} = 3:32$

$33 : 121 \neq 9 : 96$

33, 121, 9,96 are not in proportion.

(c) 24, 28, 36, 48

Sol: $24 : 28 = \frac{24}{28} = \frac{6}{7} = 6:7$

$36 : 48 = \frac{36}{48} = \frac{3}{4} = 3:4$

$24 : 28 \neq 36 : 48$

24, 28, 36, 48 are not in proportion.

(d) 32, 48, 70, 210

Sol: $32 : 48 = \frac{32}{48} = \frac{2}{3} = 2:3$

$70:210=\frac{70}{210}=\frac{1}{3}=1:3$

$32:48 \neq 70:210$

32, 48, 70, 210 are not in proportion.

(e) **4, 6, 8, 12**

Sol: $4:6=2:3$

$8:12=2:3$

$4:6=8:12$

4, 6, 8, 12 are in proportion

(f) **33, 44, 75, 100**

Sol: $33:44=3:4$

$75:100=3:4$

$33:44=75:100$

33, 44, 75, 100 are in proportion

2. **Write True (T) or False (F) against each of the following statements.**

(a) **16 : 24 :: 20 : 30 (T)**

Sol: $16:24=2:3$

$20:30=2:3$

(b) **21: 6 :: 35 : 10 (T)**

Sol: $21:6=7:2$

$35:10=7:2$

(c) **12 : 18 :: 28 : 12(F)**

Sol: $12:18=2:3$

$28:12=7:3$

(d) **8 : 9 :: 24 : 27 (T)**

Sol: $8:9=8:9$

$24:27=8:9$

(e) **5.2 : 3.9 :: 3 : 4(F)**

Sol: $5.2:3.9=52:39=4:3$

$3:4=3:4$

(f) **0.9 : 0.36 :: 10 : 4 (T)**

Sol: $0.9:0.36=90:36=10:4=5:2$

$10:4=5:2$

3. **Are the following statements true?**

(a) **40 persons : 200 persons = ₹ 15 : ₹ 75**

Sol: 40 persons : 200 persons =40:200=1:5

₹ 15 : ₹ 75=15:75=1:5

Hence given statement is true

(b) **7.5 litres : 15 litres = 5 kg : 10 kg**

Sol: 7.5 litres : 15 litres = 7.5:15=75:150=1:2

5 kg : 10 kg=5:10=1:2

Hence given statement is true

(c) **99 kg : 45 kg = ₹ 44 : ₹ 20**

Sol: 99 kg : 45 kg=99:45=11:5

₹ 44 : ₹ 20=44:20=11:5

Hence given statement is true

(d) **32 m : 64 m = 6 sec : 12 sec**

Sol: 32 m : 64 m=32:64=1:2

6 sec : 12 sec=6:12=1:2

Hence given statement is true

(e) **45 km : 60 km = 12 hours : 15 hours**

Sol: 45 km : 60 km=45:60=3:4

12 hours : 15 hours=12:15=4:5

Hence given statement is false.

4. **Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.**

(a) **25 cm : 1 m and ₹ 40 : ₹ 160**

Sol: 25 cm : 1 m=25 cm:100 cm=25:100=1:4

₹ 40 : ₹ 160=40:160=4:16=1:4

25 cm : 1 m = ₹ 40 : ₹ 160

Hence given ratios are in proportion

(b) **39 litres : 65 litres and 6 bottles : 10 bottles**

Sol: 39 litres : 65 litres=39:65=3:5

6 bottles : 10 bottles=6:10=3:5

39 litres : 65 litres = 6 bottles : 10 bottles

Hence given ratios are in proportion

(c) 2 kg : 80 kg and 25 g : 625 g

Sol: 2 kg : 80 kg=2:80=1:40

$25\ g : 625\ g = 25:625 = 1:25$

2 kg : 80 kg ≠ 25 g : 625 g

Hence given ratios are not in proportion.

(d) 200 mL : 2.5 litre and ₹ 4 : ₹ 50

Sol: 200 mL : 2.5 litre=200 mL : 2500 mL=2:25

₹ 4 : ₹ 50=4:50=2:25

200 mL : 2.5 litre = ₹ 4 : ₹ 50

Hence given ratios are in proportion

Unitary Method

In unitary method first we find the value of one unit and then the value of required number of units.

1. Read the table and fill in the boxes.

Time	Distance travelled by Karan	Distance travelled by Kriti
2 hours	8 km	6 km
1 hour	4 km	3 km
4 hours	16 km	12 km

Example 11 : If the cost of 6 cans of juice is ₹ 210, then what will be the cost of 4 cans of juice?

Sol : Cost of 6 cans of juice = ₹ 210

Cost of one can of juice $= \frac{210}{6} = ₹\ 35$

Cost of 4 cans of juice = ₹ 35 × 4 = ₹ 140.

Example 12 : A motorbike travels 220 km in 5 litres of petrol. How much distance will it cover in 1.5 litres of petrol?

Sol: In 5 litres of petrol, motorbike can travel =220 km

In 1 litre of petrol, motor bike travels $= \frac{220}{5} = 44$ km

In 1.5 litres of petrol, motorbike travels = 1.5 × 44 km = 66 km

Example 13 : If the cost of a dozen soaps is ₹ 153.60, what will be the cost of 15 such soaps?

Sol: cost of 12 soaps = ₹ 153.60

1 dozen=12

Cost of 1 soap $= \frac{153.60}{12} = ₹\ 12.80$

Cost of 15 soaps = ₹ 12.80 × 15 = ₹ 192

$$\begin{array}{r} 12.80 \\ 12\overline{)153.60} \\ 12 \\ \hline 33 \\ 24 \\ \hline 96 \\ 96 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 12.80 \\ \times\ 15 \\ \hline 6400 \\ 1280 \\ \hline 192.00 \end{array}$$

Example 14 : Cost of 105 envelopes is ₹ 350. How many envelopes can be purchased for ₹ 100?

Sol: Number of envelopes can be purchased for ₹350 = 105

Number of envelopes can be purchased for ₹1 $= \frac{105}{350}$

Number of envelopes can be purchased for ₹100 $= \frac{105}{35\cancel{0}} \times 10\cancel{0} = 3 \times 10 = 30$

Example 15 : A car travels 90 km in 2 $\frac{1}{2}$ hours.

(a) How much time is required to cover 30 km with the same speed? (b) Find the distance covered in 2 hours with the same speed.

Sol: $(a) 2\frac{1}{2}$ hours $= \frac{5}{2} \times 60$ minutes $= 150$ minutes

Time is required for 90 km = 150 minutes

Time is required for 1 km $= \frac{150}{90}$ minutes

Time is required for 30 km $= \frac{\cancel{150}^{50}}{\cancel{90}_{3}} \times \cancel{30}^{1} = 50$minutes

(b)The distance covered in 150 minutes = 90 km

The distance covered in 1 minute $= \frac{90}{150}$km

The distance covered in 120 minutes(2 hours) $= \frac{\cancel{90}^{18}}{\cancel{150}_{5}} \times \cancel{120}^{4}\ km = 18 \times 4 = 72$ km

EXERCISE 12.3

1. If the cost of 7 m of cloth is ₹ 1470, find the cost of 5 m of cloth.

Sol: The cost of 7 m of cloth = ₹ 1470

The cost of 1 m of cloth $= \frac{₹\ 1470}{7} = ₹\ 210$

The cost of 5 m of cloth = ₹ 210 × 5 = ₹ 1050

2. Ekta earns ₹ 3000 in 10 days. How much will she earn in 30 days?

Sol: Money earned by Ekta in 10 days=₹ 3000

Money earned by Ekta in 1 day $= \frac{₹\ 3000}{10} = ₹300$

Ekta will earn in 30 days = ₹300 × 30 = ₹9000

3. If it has rained 276 mm in the last 3 days, how many cm of rain will fall in one full week (7 days)? Assume that the rain continues to fall at the same rate.

Sol: Rain in 3 days=276 mm

Rain in 1 day $= \frac{276}{3} = 92\ mm$

Rain will fall in 7 days $= 7 \times 92\ mm = 644\ mm = \frac{644}{10}\ cm = 64.4\ cm$

$1\ mm = \frac{1}{10}\ cm$

4. Cost of 5 kg of wheat is ₹ 91.50

(a) What will be the cost of 8 kg of wheat? (b) What quantity of wheat can be purchased in ₹ 183?

Sol: (a) Cost of 5 kg of wheat =₹ 91.50

Cost of 1 kg of wheat $= \frac{₹\ 91.50}{5} = ₹\ 18.30$

Cost of 8 kg of wheat $= ₹\ 18.30 \times 8 = ₹146.40$

(b) Quantity of wheat can be purchased in ₹ 91.50=5 kg

Quantity of wheat can be purchased in ₹ 1 $= \frac{5}{91.50} = \frac{500}{9150} = \frac{50}{915} = \frac{10}{183}$ kg

Quantity of wheat can be purchased in ₹ 183 $= 183 \times \frac{10}{183}$ kg $= 10$ kg

5. The temperature dropped 15 degree celsius in the last 30 days. If the rate of temperature drop remains the same, how many degrees will the temperature drop in the next ten days?

Sol: The temperature dropped in the last 30 days $= 15^0C$

Temperature drop in 1 day $= \frac{15^0C}{30}$

The temperature drop in the next 10 days $= 10 \times \frac{15^0\text{C}}{30} = 5^0\text{C}$

6. Shaina pays ₹ 15000 as rent for 3 months. How much does she has to pay for a whole year, if the rent per month remains same?

Sol: Rent for 3 months=₹15000

Rent for 1 month $= \frac{₹15000}{3} = ₹5000$

1 year=12 months

Rent for a whole year(12 months) $= ₹5000 \times 12 = ₹60{,}000$

7. Cost of 4 dozen bananas is ₹ 180. How many bananas can be purchased for ₹ 90?

Sol: 4 dozen=4×12=48

Number of bananas purchased for ₹180=48

Number of bananas purchased for ₹1 $= \frac{48}{180}$

Number of bananas purchased for ₹90 $= 90 \times \frac{48}{180} = 24$

8. The weight of 72 books is 9 kg. What is the weight of 40 such books?

Sol: The weight of 72 books $= 9$ kg

The weight of 1 book $= \frac{9}{72}$ kg

The weight of 40 book $= 40 \times \frac{9}{72}$ kg $= 5$ kg

9. A truck requires 108 litres of diesel for covering a distance of 594 km. How much diesel will be required by the truck to cover a distance of 1650 km?

Sol: Diesel required for 594 km=108 L

Diesel required for 1 km $= \frac{108}{594} = \frac{2}{11}$ L

Diesel required for 1650 km $= 1650 \times \frac{2}{11}$ L

$= 150 \times 2$ L $= 300$ litres

10. Raju purchases 10 pens for ₹ 150 and Manish buys 7 pens for ₹ 84. Can you say who got the pens cheaper?

Sol: Raju purchases 10 pens for ₹ 150

Raju purchased 1 pen for $\frac{₹\ 150}{10} = ₹15$

Manish buys 7 pens for ₹ 84

Manish buy 1 pen for $\frac{₹\ 84}{7} = ₹\ 12$

Manish got the pens cheaper.

11. Anish made 42 runs in 6 overs and Anup made 63 runs in 7 overs. Who made more runs per over?

Sol: Number of runs made by Anish in 6 overs=42

Number of runs made by Anish in 1 over $= \frac{42}{6} = 7$

Number of runs made by Anup in 7 overs=63

Number of runs made by Anup in 1 over $= \frac{63}{7} = 9$

Anup made more runs per over than Anish.

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