

Direct Proportion and Inverse Proportion

PRACTICE SET 37 [PAGE 64]

Practice Set 37 | Q 1 | Page 64

If 7 kg onions cost 140 rupees, how much must we pay for 12 kg onions?

Solution: Let us suppose the cost of 12 kg onions is x rupees.

The number of onions and their cost vary in direct proportion.

$$\begin{aligned}\therefore \frac{7}{140} &= \frac{12}{x} \\ \Rightarrow x &= \frac{12 \times 140}{7} \\ &= 240 \text{ rupees}\end{aligned}$$

Hence, the cost of 12 kg onions is 240 rupees.

Practice Set 37 | Q 2 | Page 64

If 600 rupees buy 15 bunches of feed, how many will 1280 rupees buy?

Solution: Let us suppose x bunches of feed can be bought in 1280 rupees.

The number of bunches of feed and their cost vary in direct proportion.

$$\begin{aligned}\therefore \frac{15}{600} &= \frac{x}{1280} \\ \Rightarrow x &= \frac{15 \times 1280}{600}\end{aligned}$$

$$x = 32$$

Hence, 32 bunches of feed can be bought in 1280 rupees.

Practice Set 37 | Q 3 | Page 64

For 9 cows, 13 kg 500 g of food supplements are required every day. In the same proportion, how much will be needed for 12 cows?

Solution: Let us suppose x kg of food supplement required for 12 cows.



The quantity of food supplement and the number of cows vary in direct proportion.

$$\therefore \frac{9}{13.5} = \frac{12}{x}$$
$$\Rightarrow x = \frac{12 \times 13.5}{9}$$

$$x = 18 \text{ kg}$$

Hence, 18 kg of food supplement required for 12 cows.

Practice Set 37 | Q 4 | Page 64

The cost of 12 quintals of soyabean is 36,000 rupees. How much will 8 quintals cost?

Solution: Let us suppose the cost of 8 quintals of soyabean is x rupees.

The number of soyabeans and their cost vary in direct proportion.

$$\therefore \frac{12}{3600} = \frac{8}{x}$$
$$\Rightarrow x = \frac{8 \times 3600}{12}$$

$$x = 24000 \text{ rupees}$$

Hence, the cost of 8 quintals of soyabean is 24000 rupees.

Practice Set 37 | Q 5 | Page 64

Two mobiles cost 16,000 rupees. How much money will be required to buy 13 such mobiles?

Solution: Let us suppose the cost of 13 mobiles is x rupees.

The number of mobiles and their cost vary in direct proportion.

$$\therefore \frac{2}{16000} = \frac{13}{x}$$
$$\Rightarrow x = \frac{13 \times 16000}{2}$$

$$x = 104000 \text{ rupees}$$

Hence, the cost of 13 mobiles is 104000 rupees.

PRACTICE SET 38 [PAGE 66]

Practice Set 38 | Q 1 | Page 66

Five workers take 12 days to weed a field. How many days would 6 workers take? How many would 15 take?

Solution: Let us suppose 6 workers will take x days to weed a field.

As the number of workers increases, the number of days decreases.

So, the number of workers and number of days are in inverse proportion.

$$\therefore 5 \times 12 = 6 \times x$$

$$\Rightarrow x = 60/6$$

$$\Rightarrow x = 10 \text{ days}$$

Let us suppose 15 workers will take y days to weed a field.

$$\therefore 5 \times 12 = 15 \times y$$

$$\Rightarrow y = 60/15$$

$$\Rightarrow y = 4 \text{ days}$$

Hence, 6 workers will take 10 days, while 15 workers will take 4 days to weed a field.

Practice Set 38 | Q 2 | Page 66

Mohanrao took 10 days to finish a book, reading 40 pages every day. How many pages must be read in a day to finish it in 8 days?

Solution: Let us suppose Mohanrao will have to read x pages every day to finish the book in 8 days.

As the number of days decreases, the number of pages increases.

So, the number of days and number of pages are in inverse proportion.

$$\therefore 10 \times 40 = 8 \times x$$

$$\Rightarrow x = 400/8$$

$$\Rightarrow x = 50 \text{ pages}$$

Hence, Mohanrao will have to read 50 pages every day to finish the book in 8 days

Practice Set 38 | Q 3 | Page 66

Mary cycles at 6 km per hour. How long will she take to reach her Aunt's house which is 12 km away? If she cycles at a speed of 4 km/hr, how long would she take?



Solution: Given,

Case 1:

Speed = 6 km/hr

Distance = 12 km

$\therefore \text{Time} = \text{Distance/speed}$

$= 12/6$

$= 2 \text{ hours}$

Case 2:

Speed = 4 km/hr

Distance = 12 km

$\therefore \text{Time} = \text{Distance/Speed}$

$= 12/4$

$= 3 \text{ hours}$

Hence, if the speed of cycle is 6 km/hr then, Marry will take 2 hours and if the speed of cycle is 4 km/hr then, she will take 3 hours to reach her Aunt's house.

Practice Set 38 | Q 4 | Page 66

The stock of grain in a government warehouse lasts 30 days for 4000 people. How many days will it last for 6000 people?

Solution: Let us suppose the stock of grain in a government warehouse lasts x days for 6000 people.

As the number of people increases, the number of days decreases.

So, the number of days and number of people are in inverse proportion.

$\therefore 30 \times 4000 = 6000 \times x$

$\Rightarrow x = 120000/6000$

$\Rightarrow x = 20 \text{ days}$

Hence, the stock of grain in a government warehouse lasts 20 days for 6000 people.

PRACTICE SET 39 [PAGE 68]

Practice Set 39 | Q 1 | Page 68

Suresh and Ramesh together invested 144000 rupees in the ratio 4:5 and bought a plot of land. After some years they sold it at a profit of 20%. What is the profit each of them got?

Solution: The proportion of Suresh's and Ramesh's investment is 4:5.

The profit is shared in the same proportion as the investment, hence, the proportion of profit is 4:5.

Now, profit = $20/100 \times 144000$

= 28800 rupees

Therefore, the profit of Suresh and Ramesh is given by

Suresh's profit = $4/9 \times 28800$

= 12800 rupees

Ramesh's profit = $5/9 \times 28800$

= 16000 rupees

Hence, Suresh and Ramesh got a profit of 12800 and 16000 rupees respectively.

Practice Set 39 | Q 2 | Page 68

Virat and Samrat together invested 50000 and 120000 rupees to start a business. They suffered a loss of 20%. How much loss did each of them incur?

Solution: The proportion of Virat's and Samrat's investment is given by 50000:120000 = 5:12

The loss is shared in the same proportion as the investment, hence, the proportion of profit is 5:12.

Now, Loss = $20/100 \times (50000+120000)$

= $20/100 \times (170000)$

= 34000 rupees

Therefore, the loss incurred by Virat and Samrat is given by

Virat's loss = $5/17 \times 34000$

= 10000 rupees

Samrat's loss = $12/17 \times 34000$

= 24000 rupees

Hence, Virat and Samrat incurred the loss of 10000 and 24000 rupees respectively.

Practice Set 39 | Q 3 | Page 68

Shweta, Piyush, and Nachiket together invested 80000 rupees and started a business of selling sheets and towels from Solapur. Shweta's share of the capital was 30000 rupees and Piyush's 12000. At the end of the year, they had made a profit of 24%. What was Nachiket's investment and what was his share of the profit?

Solution: Nachiket's investment = Total investment – (Shweta's investment + Piyush's investment)
 $= 80000 - (30000 + 12000)$
 $= 80000 - 42000$
 $= 38000$ rupees

The proportion of Shweta's, Piyush's and Nachiket's investment is given by
 $30000:12000:38000 = 15:6:19$

The profit is shared in the same proportion as the investment, hence, the proportion of profit is 15:6:19.

Now, Profit = $24/100 \times (80000)$
 $= 19200$ rupees

Therefore, Nachiket's share of the profit is given by
 $= 19/40 \times 19200$
 $= 9120$ rupees

Hence, Nachiket's investment and his share of the profit are 38000 and 9120 rupees respectively.

Practice Set 39 | Q 4 | Page 68

A and B shared a profit of 24500 rupees in the proportion 3:7. Each of them gave 2% of his share of the profit to the Soldiers' Welfare Fund. What was the actual amount given to the Fund by each of them?

Solution: Amount of share to the Soldiers' Welfare Fund = 2% of 24500
 $= 490$ rupees

The profit is shared in the proportion of 3:7.

Therefore, A's share of the Fund is given by

$= 3/10 \times 490$
 $= 147$ rupees

Therefore, B's share of the Fund is given by

$= 7/10 \times 490$
 $= 343$ rupees

Hence, A's and B's share to the fund are 147 and 343 rupees respectively.

Practice Set 39 | Q 5 | Page 68

Jaya, Seema, Nikhil, and Neelesh put in altogether 360000 rupees to form a partnership, with their investments being in the proportion 3: 4: 7: 6. What was Jaya's actual share in the capital? They made a profit of 12%. How much profit did Nikhil make?

Solution: Total investment = 360000 rupees

$$\begin{aligned}\text{Total profit} &= 12/100 \times 360000 \\ &= 43200 \text{ rupees}\end{aligned}$$

The profit is shared in the same proportion as the investment, hence, the proportion of profit is 3:4:7:6.

$$\begin{aligned}\text{Jaya's share is given by} \\ 3/20 \times 360000 \\ &= 54000 \text{ rupees}\end{aligned}$$

$$\begin{aligned}\text{Nikhil's share in the profit is given by} \\ 7/20 \times 43200 \\ &= 15120 \text{ rupees}\end{aligned}$$

Hence, Jaya's share and Nikhil's profits are 54000 and 15120 rupees respectively.

