

#463746

Following are the car parking charges near a railway station up to

Time	Parking charges
4 hours	Rs. 60
8 hours	Rs. 100
12 hours	Rs. 140
24 hours	Rs. 180

Check if the parking charges are in direct proportion to the parking time.

Solution

Ratio of parking charges to no. of hours are

$\frac{60}{4} = 15, \frac{100}{8} = \frac{25}{2}, \frac{140}{12} = \frac{35}{3}, \frac{180}{24} = \frac{15}{2}$

Each ratios are not same.

So, the parking charges are not in direct proportion to the parking time.

#463747

A mixture of paint is prepared by mixing 1 part of red pigments with 8 parts of base. In the following table, find the parts of base that need to be added

Parts of red pigment	1	4	7	12	20
Parts of base	8	...	...	...	...

Solution

While mixing, the ratio of pigment and base should be same

So we have red pigment to base ratio given as **1:8**

For red pigment = 4

Base  $\Rightarrow \frac{1}{8} = \frac{4}{x} = 32$

For red pigment = 7

Base  $\Rightarrow \frac{1}{8} = \frac{7}{x} = 56$

For red pigment = 12

Base  $\Rightarrow \frac{1}{8} = \frac{12}{x} = 96$

For red pigment = 20

Base  $\Rightarrow \frac{1}{8} = \frac{20}{x} = 160$

#463748

2A mixture of paint is prepared by mixing 1 part of red pigments with 8 parts of base. In the following table, find the parts of base that need to be added

Parts of red pigment	1	4	7	12	20
Parts of base	8	...	...	...	...

If 1 part of a red pigment requires 75 mL of base, how much red pigment should we mix with 1800 mL of base?

Solution

1 part  $\Rightarrow$  75 ml base

$\therefore$   $x$  part  $\Rightarrow$  1800ml base

$$\text{So, } \frac{x}{1800} = \frac{1}{75}$$

$$\Rightarrow x = \frac{1 \times 1800}{75}$$

$$\Rightarrow x = 24 \text{ ml}$$

#### #463749

A machine in a soft drink factory fills 840 bottles in six hours. How many bottles will it fill in five hours?

#### Solution

According to direct proportion,

$$\frac{840}{6} = \frac{x}{5}$$

$$\Rightarrow x = \frac{840 \times 5}{6}$$

$$\Rightarrow 700$$

#### #463751

In a model of a ship, the mast is 9 cm high, while the mast of the actual ship is 12 m high. If the length of the ship is 28 m, how long is the model ship?

#### Solution

Mast in model of ship = 9cm

Mast of actual ship = 12cm

So, ratio of model to actual mast is  $\frac{9}{12} = \frac{3}{4}$

If length of ship is 28cm, then length of model of ship is

$$\frac{x}{28} = \frac{3}{4}$$

Hence, length of model ship = 21 cm.

#### #463752

Suppose 2 kg of sugar contains 9106 crystals. How many sugar crystals are there in (i) 5 kg of sugar? (ii) 1.2 kg of sugar?

#### Solution

$$(i) \quad \text{No. of crystals in 5 kg of sugar} = \left( \frac{9 \times 106}{2} \right) \times 5 = 360 \text{ crystals}$$

$$(ii) \quad \text{No. of crystals in 1.2 kg of sugar} = \left( \frac{9 \times 106}{2} \right) \times 1.2 = 572.4 \text{ crystals}$$

#### #463753

Rashmi has a road map with a scale of 1 cm representing 18 km. She drives on a road for 72 km. What would be her distance covered in the map?

#### Solution

$$x_1 = 1 \text{ and } x_2 = ?$$

$$y_1 = 18 \text{ and } y_2 = 72$$

Now,

$$\frac{x_1}{y_1} = \frac{x_2}{y_2}$$

$$\Rightarrow \frac{1}{18} = \frac{x_2}{42}$$

$$\Rightarrow x_2 = 4 \text{ cm}$$

#### #463754

A 5 m 60 cm high vertical pole casts a shadow 3 m 20 cm long. Find at the same time

(i) the length of the shadow cast by another pole 10 m 50 cm high

(ii) the height of a pole which casts a shadow 5 m long.

#### Solution

$$(i) \frac{x_1}{y_1} = \frac{x_2}{y_2}$$

$$\Rightarrow \frac{5.6}{3.2} = \frac{10.5}{y_2}$$

$$\Rightarrow y_2 = 6 \text{ cm}$$

$$(ii) \frac{x_1}{y_1} = \frac{x_3}{y_3}$$

$$\Rightarrow \frac{5.6}{3.2} = \frac{x_3}{5}$$

$$\Rightarrow x_3 = 8.75 \text{ m}$$

#### #463756

Which of the following are in inverse proportion?

- (i) The number of workers on a job and the time to complete the job.
- (ii) The time taken for a journey and the distance travelled in a uniform speed.
- (iii) Area of cultivated land and the crop harvested.
- (iv) The time taken for a fixed journey and the speed of the vehicle.
- (v) The population of a country and the area of land per person.

#### Solution

Two quantities are in inverse proportion only if one of them increases and the other decreases.

- i) Inverse proportion  $\Rightarrow$  If number of workers increases, then the time to complete job decreases.
  - ii) Not Inverse proportion  $\Rightarrow$  If time taken for a journey increases, then the distance travelled at uniform speed remains same.
  - iii) Not Inverse proportion  $\Rightarrow$  If area of cultivated land increases, then harvested crop will also increase.
  - iv) Inverse proportion  $\Rightarrow$  If time taken for a fixed journey increases, then the speed of vehicle decreases, so it is in inverse proportion
  - v) Inverse proportion  $\Rightarrow$  If population of a country increases, then the area of land per person decreases.
- $\therefore$  (i), (iv) and (v) are in inverse proportion.

#### #463757

In a Television game show, the prize money of Rs 1, 00, 000 is to be divided equally amongst the winners. Complete the following table and find whether the prize money given to an individual winner is directly or inversely proportional to the number of winners?

Number of winners	1	2	4	5	8	10	20
Prize of each winner (in Rs)	1, 00, 000	50, 000	...	...	...	...	...

Solution

Let  $x$  be the number of winners and  $y$  be the number of prize for each winner.  
so here total amount for prize money is same i.e.  
 $k = x \times y = 1, 00, 000$

let  $x_1$  prize for 4 people  
 $\Rightarrow 4 \times x_1 = 100000$   
 $\Rightarrow x_1 = 25000$

Similarly,  
For 5 people  $x_2 = 20000$   
For 8 people  $x_3 = 12500$   
For 10 people  $x_4 = 10000$   
For 20 people  $x_5 = 5000$

#463758



Rehman is making a wheel using spokes. He wants to fix equal spokes in such a way that the angles between any pair of consecutive spokes are equal. Help him by completing the following table.

Number of spokes	4	6	8	10	12
Angle between a pair of consecutive spokes (in degrees)	90	60	...	...	...

- (i) Are the number of spokes and the angles formed between the pairs of consecutive spokes in inverse proportion?
- (ii) Calculate the angle between a pair of consecutive spokes on a wheel with 15 spokes
- (iii) How many spokes would be needed, if the angle between a pair of consecutive spokes is  $40^\circ$ ?

Solution

$$k = 4 \times 90 = 360 \text{ degrees}$$

$$\text{Angle for 8 spoke} = \frac{360}{8} = 45 \text{ degrees}$$

$$\text{Angle for 10 spoke} = \frac{360}{10} = 36 \text{ degrees}$$

$$\text{Angle for 12 spoke} = \frac{360}{12} = 30 \text{ degrees}$$

(i) As with increasing no. of spokes the angle is decreasing so they are in inverse proportion

$$\text{(ii) Required angle} = \frac{360}{15} = 24 \text{ degrees}$$

$$\text{(iii) No. of spokes needed} = \frac{360}{40} = 9 \text{ spokes}$$

#### #463759

If a box of sweets is divided among 24 children, they will get 5 sweets each. How many would each get, if the number of the children is reduced by 4?

#### Solution

Number of children = 24

After dividing sweets each student will get 5 sweets

So, total number of sweets in the box is  $24 \times 5 = 120$

Now, we have reduced the number of students by 4

$\therefore$  Total number of children is 20

So each student will get  $\frac{120}{20} = 6$  sweets

#### #463760

A farmer has enough food to feed 20 animals in his cattle for 6 days. How long would the food last if there were 10 more animals in his cattle?

#### Solution

If 20 animals eat food in 6 days, then

30 animals can eat for  $\frac{6 \times 20}{30} = 4$  days

#### #463765

Two persons could fit new windows in a house in 3 days.

(i) One of the persons fell ill before the work started. How long would the job take now?

(ii) How many persons would be needed to fit the windows in one day?

#### Solution

Given, 2 persons can fit new window in a house in 3 days.

(i) One of the person got ill.

Then no. of days required would be  $= \frac{2 \times 3}{1} = 6$  days

(ii) To fit window in 1 day,

No. of person required would be  $= \frac{2 \times 3}{1} = 6$  persons