

21/12/2020

Q.1

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

4 hours	₹ 60
8 hours	₹ 100
12 hours	₹ 140
24 hours	₹ 180

check if the parking charges are in direct proportion to the parking time

Sol

$$C_1 = 1 \text{ hr.} = \frac{60}{4} = 15$$

$$C_2 = 1 \text{ hr.} = \frac{100}{8} = 12.5$$

$$C_3 = \frac{140}{12} = 11.67$$

$$C_4 = \frac{180}{24} = 7.5$$

Q2

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

~~Q2~~

Parts of red pigment	Parts of base
1	8
4	<u>32</u>
7	<u>56</u>
12	<u>96</u>
20	<u>160</u>

Sol:

$$1 \cdot 8 = \frac{a^1}{b^1} = k$$

$$a_2 = 4 \quad b_2 = 7$$

$$\frac{a_2}{b_2} = k \quad \Bigg| \quad \frac{4}{b_2} = \frac{1}{8} \quad b_2 = 32$$

$$a_3 = 7 \quad \frac{a^3}{b^3} = k$$

$$\frac{7}{b_3} = \frac{1}{8} \quad b_3 = 56$$

$$a^4 = 12 \quad \frac{a^4}{b^4} = k$$

$$\frac{12}{b^4} = \frac{1}{8} \quad b^4 = 96$$

$$a^5 = 20$$

$$\frac{a^5}{b^5} = k$$

$$\frac{20}{b^5} = \frac{1}{8} \Rightarrow b^5 = 160$$

Q.3 In question 2 above, if 1 part of a seed pigment requires 75 ml of base, how much seed pigment should we mix with 1800 ml of base?

Sol: Let the part of seed pigment be  $x$

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

$$x \times 75 = 1800$$

$$x = \frac{1800}{75} = 24$$

$\therefore 24$  parts

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Q.4 A machine in a soft drink factory fills 840 bottles in 6 hours. How many bottles will it fill in five hours?

Sol: Let the bottles be  $x$   
Hours = 6  
Bottles = 840

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

$$6 \times x = 5 \times 840$$

$$6x = 4200$$

$$x = \frac{4200}{6} = 700$$

$$x = 700$$

Q.5 A photograph of a bacteria enlarged 50,000 times attain a length of 5 cm what is the actual length of the bacteria? if the photograph is enlarged 20,000 times only, what would be its enlarged length?

Sol: Actual length =  $\frac{5}{50,000} \times \frac{1}{20,000}$

$$= \frac{1}{10^4} = 10^{-4}$$

Sol: Let the length =  $x$

$$50,000 = 20,000$$

$$5cm = x$$

$$\frac{50000}{5} = \frac{20,000}{x}$$

$$50000 \times x = 20,000 \times 5$$

$$50000x = 10,000$$

$$x = \frac{10,000}{50,000}$$

$$x = 2cm$$

Q.6 In a model of a ship, the mast is 9cm high while the mast of the actual ship is 12m high. If the length of the ship is 28m, how long is the model ship?

Sol: Let the length of the model ship =  $x$

Actual length = 28m  $x$

Height = 12m 9cm

$$\frac{28}{12} = \frac{x}{9}$$

$$28 \times 9 = x \times 12$$

$$252 = 12x$$

$$\frac{252}{12} = x$$

$$x = 21cm$$

Q.7 Suppose 2 kg of sugar contain  $9 \times 10^6$  crystals. How many sugar crystals are there in

- (i) 5 kg of sugar?
- (ii) 1.2 kg of sugar

Sol: Let the no. of crystals be  $x$

Sugar = (kg)	2	5
No. of crystal	$9 \times 10^6$	$x$

$$\frac{2}{9 \times 10^6} = \frac{5}{x}$$

$$2x = 5 \times 9 \times 10^6$$

$$x = \frac{5 \times 9 \times 10^6}{2}$$

$$= \frac{22.5 \times 10^6}{1}$$

$$= 2.25 \times 10 \times 10^6$$

$$= 2.25 \times 10^7$$

(i) Let the no. of crystals be  $x$

Sugar	2	1.2	$\frac{2}{9 \times 10^6}$	$= \frac{1.2}{x}$
No. of crystal	$9 \times 10^6$	$x$		

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$$2x = 1.2 \times 9 \times 10^6$$

$$x = \frac{1.2 \times 9 \times 10^6}{2}$$

$$x = 12 \times 4.5 \times 10^6$$

$$x = 5.4 \times 10^6$$

Q.8 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?

Sol:- Let the distance covered in map =  $x$

Map	1	$x$
Act cm	18	72

$$\frac{1}{18} = \frac{x}{72}$$

$$18x = 72$$

$$x = \frac{72}{18} = 36 \div 4 = 9$$

$$x = 9 \text{ cm}$$

Q.9 A 5 m 60 cm high vertical pole casts a shadow 3 m 20 cm long. Find at the same time the length of the shadow cast by another pole 10 m 50 cm high.

Sol:

$$1\text{m} = 100\text{ cm}$$

$$5\text{m } 60\text{ cm} = 500 + 60 \\ = 560\text{ cm}$$

$$3\text{m } 20\text{ cm} = 300 + 20 \\ = 320\text{ cm}$$

$$10\text{m } 50\text{ cm} = 1000 + 50 \\ = 1050\text{ cm}$$

Pole	560	1050
Shadow	320	$x$

$$\frac{560}{320} = \frac{1050}{x}$$

$$560x = 1050 \times 320$$

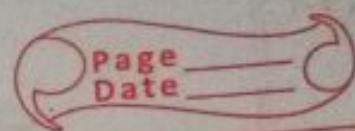
$$x = \frac{150}{1050} \times \frac{16}{320} \times 84$$

$$x = 600\text{ cm}$$



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Maths  
ch-13



Q.10 A loaded truck travels 14 km in 25 minutes. If the speed remains the same, how far can it travel in 5 hours?

Sol: Let the distance =  $x$

$$1 \text{ hr} = 60 \text{ min}$$

$$5 \text{ hr} = 5 \times 60$$

$$= 300 \text{ min}$$

Distance	14 km	$x$
Time	25 min	300 min

$$\frac{14}{25} = \frac{x}{300}$$

$$25x = 14 \times 300$$

$$x = \frac{14 \times 300}{25}$$

$$x = 168 \text{ km}$$

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Ex 13.4

Q1 Which of the following are in inverse proportion:

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

Q2 In a television game show, the prize money of ₹1,00,000, is to be divided equally amongst the winner. 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? -

No. of winners	Prize of each
1	1,00,000
2	50,000
4	25,000
5	20,000
8	12,500
10	10,000
20	5000

(i) No. of winner = 4  
Prize of each ind. =  $\frac{1,00,000}{4} = 25,000$

(ii) No. of winner = 5  
Prize of each ind. =  $\frac{1,00,000}{5} = 20,000$

(iii) No. of winner = 8  
Prize of each ind. =  $\frac{1,00,000}{8} = 12,500$

(iv) No. of winner = 10  
Prize of each ind. =  $\frac{1,00,000}{10} = 10,000$

(v) No. of winner = 20  
Prize of each ind. =  $\frac{1,00,000}{20} = 5,000$

This is inverse proportion

Q.3 Rehman is making 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	90°	60°	45°	36°	30°

$$= \frac{4 \times 90}{8} = 45$$

$$= \frac{4 \times 90}{10} = 36$$

$$= \frac{4 \times 90}{12} = 30$$

$$= \frac{4 \times 90}{10} = 36$$

$$= \frac{4 \times 90}{12} = 30$$

$$= \frac{4 \times 90}{12} = 30$$

(ii)

spokes	4	15
Angle.	90°	a

$$4 \times 90^\circ = 15 \times a$$

$$4 \times 90^\circ = 15a$$

$$\frac{4 \times 90^\circ}{15} = a$$

$$240 = a$$

(iii) How many spokes would be needed, if the angle between pairs of consecutive...

Sol :-

spokes	4	...
angle	90°	40°

$$4 \times 90^\circ = b \times 40^\circ$$

$$1 \times 4 \times 90^\circ = b$$

$$\frac{360^\circ}{40^\circ}$$

$$9 = b$$

Q.4 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?

Sol :-

$$\begin{aligned} \text{Total sweets} &= 24 \times 5 \\ &= 120 \end{aligned}$$

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$$\text{children} = 24 - 4 = 20$$

$$\text{Each will get} = \frac{6 \times 120}{20} = 36$$

Q.5 A farmer has enough food to feed 20 animals in his cattle for 6 days. How long would the food last if there were 30 more animals in his cattle?

Sol:

No. of animal	20	30
Days	6	$x$

$$20 \times 6 = 30 \times x$$

$$120 = 30x$$

$$4 = x$$

$$4 = x$$

$$4 = x$$

Q.6 A contractor estimate that 3 person could wire Jasminde's house in 4 day if he use 4 person instead of three how long should they take to complete the job?

Sol:

No. of person	3	4
Days	4	$x$

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$$8 \times 9 = 4 \times x$$

$$12 = 4x$$

$$\frac{12 \times 3}{4 \times 1} \quad 3 = x$$

Q.7 A batch of bottles was packed in 25 boxes with 12 bottles in each box of the same batch is packed using 20 bottles in each box, how many boxes will be filled?

Sol:-

$$\text{No. of boxes} = 25, \quad x$$

$$\text{No. of bottles} = 12, \quad 20$$

in each box

$$25 \times 12 = x \times 20$$

$$525 \times 12 = 20x$$

$$\frac{525}{20} \times 12 = x$$

$$x = 15$$

Q.8 A factory requires 92 machines to produce a given number of articles in 63 days. How many machines would be required to produce the same number of articles in 54 days?

Sol:-

Machines	42	x
No. of day	63	54

$$42 \times 63 = x \times 54$$

$$\frac{2 \times 7}{54} \times 63 = 54x$$

$$27 \times 1$$

$$49 = x$$

Q.9

A car takes 2 hours to reach a destination by travelling at the speed of 60 km/hr. How long will it take when the car travels at the speed of 80 km/hr?

Sol:-

Speed =	60 km/hr	80 km/h
Time =	2 hr.	x

$$60 \times 2 = 80 \times x$$

$$3 \frac{60 \times 2}{80} = x$$

$$\frac{3}{2} = x$$

$$x = 1 \frac{1}{2} \text{ hr.}$$



Q.10 Two person can 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?

<u>Sol</u>	No. of person	Days
	2	3
	1	$x$

$$2 \times 3 = x$$
$$6 = x$$

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

<u>Sol</u>	No. of people	Day
	2	3
	$x$	1

$$2 \times 3 = 1 \times x$$
$$6 = x$$

6 people needed.

Q. 1 A school has 8 periods a day each of 15 min duration. How long would each period be, if the school has 9 periods a day, assuming, the numbers of school hours to be the same?

Sol:

Time	15 min	$x$
No. of periods	8	9

$$15 \times 8 = x \times 9$$

$$5 \times 48 \times 8 = x$$

$$\underline{\quad} x$$

$$\boxed{x = 40}$$