I.G.C.S.E. Ratio & Proportion

Index:

Please click on the question number you want

You can access the solutions from the end of each question

Question 1

On a map of scale 1 : 50 000 two towns appear 8 cm apart. What is the actual distance between the towns in km?

Click here to read the solution to this question

Click here to return to the index

Solution to question 1

1 cm on the map = 50 000 cm on the land

8 cm on the map = $8 \times 50\,000 = 400\,000$ cm on the land

$$400\,000 \text{ cm} = \frac{400\,000}{100} = 4\,000 \text{ m}$$

Note: 1 m = 100 cm

$$4\,000 \text{ m} = \frac{4000}{1000} = 4 \text{ km}$$

1 km = 1000 m

Click here to read the question again

Click here to return to the index

Question 2

The length of a road is 5.5 km. How long will it be on a map of scale 1 : 25 000

Click here to read the solution to this question

Click here to return to the index

Solution to question 2

Remember that 1 cm on the map is 25 000 cm on the land.

$$5.5\,\text{km} = 5.5 \times 1000\,\text{m} = 5500\,\text{m}$$

$$5500\,\text{m} = 5500 \times 100\,\text{cm} = 550000\,\text{cm}$$

Now 550 000 cm on the land is $= \dfrac{550000}{25000} = 22\,\text{cm}$ on the map.

Click here to read the question again

Click here to return to the index

Question 3

Share $54 in the ratio 4 : 5.

Click here to read the solution to this question

Click *here* to return to the index

Solution to question 3

To share \$54 in the ratio 4 : 5, there are $4+5=9$ parts altogether.

$$\text{1 part is } \frac{54}{9}=\$6$$
$$\text{4 parts is } 4\times 6=\$24$$
$$\text{5 parts is } 5\times 6=\$30$$

Therefore the required ratio is \$24 : \$ 30.

Click here to read the question again

Click here to return to the index

Question 4

At an election 672 voted for either Mr Black, Mr Green or Mr White in the ratio of 3 : 2 : 7. How many people voted for Mr White?

Click here to read the solution to this question

Click here to return to the index

Solution to question 4

To share 672 in the ratio 3 : 2 : 7, there are $3+2+7=12$ parts altogether.

$$\text{1 part is } \frac{672}{12}=56 \text{ votes}$$
$$\text{3 parts is } 3\times 56=168 \text{ votes}$$
$$\text{2 parts is } 2\times 56=112 \text{ votes}$$
$$\text{7 parts is } 7\times 56=392 \text{ votes}$$

Therefore Mr White receives 392 votes.

Click here to read the question again

Click here to return to the index

Question 5

A teacher wishes to photocopy the word “MATHEMATICS”, which has length 24 cm on the original. How long will the copy be if

a. the photocopier enlarges the original in the ratio 3 : 5?

b. the photocopier reduces the original in the ratio 8 : 3?

Click here to read the solution to this question

Click here to return to the index

Solution to question 5

a. The photocopier enlarges the original by $\frac{5}{3}$

The size of the copy will be $\frac{5}{\cancel{3}^{1}} \times \frac{\cancel{24}^{8}}{1} = 40$ cm

b. The photocopier enlarges the original by $\frac{3}{8}$

The size of the copy will be $\frac{3}{\cancel{8}^{1}} \times \frac{\cancel{24}^{3}}{1} = 9$ cm

Click here to read the question again

Click here to return to the index

Question 6

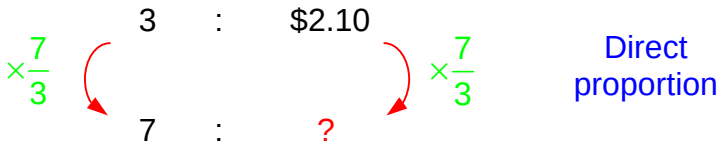
Find the cost of 7 packets of biscuits if 3 cost $2.10.

Click here to read the solution to this question

Click here to return to the index

Solution to question 6

The ratio of packets of biscuits to price is



If the number of packets of biscuits goes up then the price will increase.

The cost of 7 packets of biscuits is $= \frac{7}{\cancel{3}^{1}} \times \frac{\cancel{2.10}^{0.70}}{1} =$ $4.90

Click here to read the question again

Click here to return to the index

Question 7

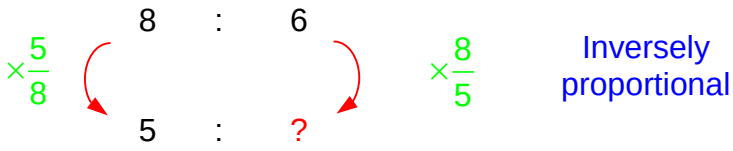
If 8 men can build a wall in 6 hours, how long will it take 5 men?

Click here to read the solution to this question

Click here to return to the index

Solution to question 7

The ratio of men to hours is



Note if the number of men goes down then the time needed to build the wall will increase.

The number of hours needed to build the wall with 5 men is

$$= \frac{8}{5} \times \frac{6}{1} = \frac{48}{5} = 9.6 \text{ hours or } 9 \text{ hours } 36 \text{ minutes}$$

Click here to read the question again

Click here to return to the index

Question 8

A car travels 350 km on 40 litres of petrol. How many litres of petrol are needed for a journey of 150 km?

Click here to read the solution to this question

Click here to return to the index

Solution to question 8

The ratio of distance travelled to litres of petrol is

$$\times\frac{150}{350}=\frac{3}{7} \qquad \begin{matrix} 350 & : & 40 \\ 150 & : & ? \end{matrix} \qquad \times\frac{150}{350}=\frac{3}{7}$$

Direct proportion

Note: If the distance goes down then less number of litres is needed.

The number of litres of petrol needed for a journey of 150 km is

$$=\frac{3}{7}\times\frac{40}{1}=\frac{120}{7}=17.1 \text{ litres}$$

Click here to read the question again

Click here to return to the index

Question 9

Five machines can fill 10 000 cartons of milk in 6 hours. How many cartons of milk four machines can fill in 12 hours?

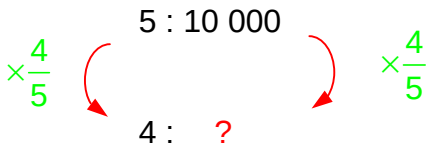
Click here to read the solution to this question

Click here to return to the index

Solution to question 9

Five machines can fill 10 000 cartons of milk in 6 hours. How many cartons of milk four machines can fill in 12 hours?

The ratio of machines to cartons of milk is



Direct proportion

Note: If the number of machines goes down then the number of cartons that are filled in 6 hours decreases.

The number of cartons that can be filled by 4 machines in 6 hours is

$$= \frac{4}{\cancel{5}} \times \frac{10\,\cancel{000}^{2000}}{1} = 8000 \text{ cartons}$$

The number of cartons that can be filled by 4 machines in 12 hours is

$$= 2 \times 8000 = 16000 \text{ cartons}$$

Click here to read the question again

Click here to return to the index

Question 10

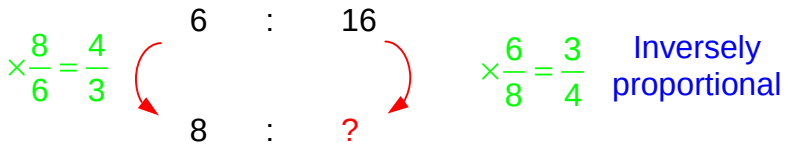
A party of 16 explorers decide to explore a desert and only have 100 litres of water, which will last them 6 days. If they decide to explore the desert for 8 days how many explorers can they take?

Click here to read the solution to this question

Click here to return to the index

Solution to question 10

The ratio of days to explorers is



Note if the number of days goes up then the number of explorers will decrease, if they only have 100 litres of water.

The number of explorers in the party will be

$$= \frac{3}{\cancel{4}^{1}} \times \frac{\cancel{16}^{4}}{1} = 12 \text{ men}$$

Click here to read the question again

Click here to return to the index