

EQUITY

LEARNING PLACE

Elementary Math Topical (**Proportion**)

Question 1:

Given y varies directly as x^2 and $y = 48$ when $x = 4$ find the equation connecting y and x .

Question 2:

It is given that centrifugal force F is proportional to the square of the velocity, v , of the moving object.

If F is 6250 N when the speed is 25 m/s, write down the formula of relating F and v .

Hence find the value of F when the velocity of the object is increased by 5 m/s.

Question 3:

The speed of a missile fired from its launcher is inversely proportional to the square root of its mass. When the mass is 36kg, the speed is 480m/s. Using x to represent speed in m/s and m to represent mass in kilograms with k as a constant,

- write an equation connecting x and m ,
- use the equation in (a) to find its mass when its speed is 600m/s.

Question 4:

M is inversely proportional to the square of P . When $M = 6$, $P = 4$, find

- the equation connecting M and P ,
- the values of M when $P = 10$,
- the value of P when the M is 24.

Question 5:

Given that p is inversely proportional to q^2 and that $p = 100$ when $q = 2$, express p in terms of q .

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Question 6:

y is inversely proportional to x^3 and $y = 2$ when $x = 5$. Find y when $x = 3$.

Question 7:

It is given that y is inversely proportional to $(x - 2)$ and that $y = 2$ when $x = 11$.

a) Find the value of y when $x = 5$.

b) Express x in terms of y .

Question 8:

It is given that y is proportional to x^2 . It is known that $y = 10$ for a particular value of x . Find the percentage increase in the value of y if the value of x is increased by 200%.

Question 9:

Q is proportional to the square of R . It is known that $Q = 6$ for a particular value of R . Find the value of Q when this value of R is doubled.

Question 10:

Given that p is proportional to the square of q , it is known that $p = 12$ for a particular value of q . Find the value of p when the value of q is increased by 100%.

Question 11:

The gravitational force, F , between two huge objects is inversely proportional to square of the distance between the two objects. Given that the force is 40 N when the distance is r km, find the gravitational force if the distance is halved.

Question 12:

F is inversely proportional to the cube of g . It is known that $F = 192$ for a particular value of g . Find the value of F when this value of g is increased by 100%.

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Question 13:

Sally can paint a room in 5 hours. Johnny can paint the same room in 4 hours. Find the time taken by Sally and Johnny if they work together to paint the room.

Question 14:

In a fried chicken joint “6 Fingers”, it takes 3 hours for 4 workers to fry 1200 pieces of chicken. How long will it take for 5 workers to fry 2000 pieces of chicken at the same rate?

Question 15:

An experienced worker takes 10 minutes to cover a 1 metre cement pavement whereas a normal worker takes 20 minutes to cover the same cement pavement. How much cement pavement will they cover if they work together for an hour?

Question 16:

A map Eastern Europe has a scale of 1 : 2 500 000.

- The length of the river Danube on the map is 114.4 cm. Calculate the actual length, in kilometres, of the river Danube.
- The area of Poland is approximately 312 679 km². Calculate the area, in square centimeters, of Poland on the map.

Question 17:

A map of Singapore has a scale of 1 : 200 000.

- The length of Yio Chu Kang Road on the map is 4.7 cm. Calculate the actual length, in kilometres, of Yio Chu Kang Road.
- The area of Singapore largest island, Pulau Tekong, is 24.43 km². Calculate the area, in square centimetres, of Pulau Tekong, on the map. Leave your answer to 2 decimal places.

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Question 18:

A map is drawn to a scale of 1 : 50 000.

- a) A road is represented by a line of length 1.8 cm on the map. Calculate the actual length of the road, giving your answer in kilometres.
- b) The actual area of an airport is 3.4 km². Find the area, in cm², of the airport on the map.

Question 19:

A plan of a house is drawn to scale of 2 cm to 15 m.

- a) Express the scale of the plan in the form 1 : n
- b) Find the area of a rectangular garden in m² if it measures 4 cm by 3.5 cm on the plan

Question 20:

The scale of a map of Singapore is 1 : n

- a) The length of Lim Chu Kang Road on the map is 16 cm. The actual length of Lim Chu Kang Road is 8 km.
 - a) Find the value of n .
 - b) The area of Hougang Town is 13.9 km². Calculate the area, in square centimetres, of Hougang Town on the map.

Question 21:

The area of a piece of land is 2.5 km². On a map, the area of the piece of land is 10 cm².

- a) Express the scale of the map in the form 1 : n , where n is a positive integer.
- b) Find, in square cm, the area representing the same piece of land on another map whose scale is 1 : 100 000.