

Inverse Proportion: $y = k/x$ *stretch*

ANSWERS 

1



y is inversely proportional to x .
When $x = 8$, $y = 4.5$. Find x when $y = 12$.

$$k = 8 \times 4.5 = 36; 12 = \frac{36}{x}$$

Answer $x = 3$

2



y is inversely proportional to $\sqrt{x}$.
When $x = 9$, $y = 10$. Find y when $x = 25$.

$$k = 10 \times \sqrt{9} = 30; \frac{30}{\sqrt{25}}$$

Answer $y = 6$

3



The amount each winner of a prize gets is inversely proportional to the number of winners. With 8 winners, each gets £375. How many winners are there when each gets £120?

$$8 \times 375 = \text{£}3000 \text{ in all; } 3000 \div 120$$

Answer 25 winners

4



y is inversely proportional to x^3 .
Complete the table.

x	1	2	4
y	40	5	0.625

$$k = 40; x^3 = 40 \div 0.625 = 64$$

Gaps 40 and 4

5



The time to empty a tank is inversely proportional to the rate the pump works. At 40 litres a minute the tank empties in 1 hour 15 minutes. Find the rate that empties it in 48 minutes.

$$1 \text{ hour } 15 \text{ minutes} = 75 \text{ minutes}$$

$$40 \times 75 = 3000; 3000 \div 48$$

Answer 62.5 litres a minute

6



y is inversely proportional to x^2 .
When $x = 2$, $y = 9$. Leo writes $y = \frac{18}{x}$, so when $x = 3$, $y = 6$. Explain his mistake and find the correct value of y .

$$\text{he used } \frac{k}{x}, \text{ not } \frac{k}{x^2}$$

$$k = 9 \times 2^2 = 36; \frac{36}{9}$$

Answer $y = 4$

7



y is inversely proportional to x .
When $x = 5$, $y = 12$. Find the positive value of x for which $y = x$, to 2 decimal places.

$$k = 60, \text{ so } x = \frac{60}{x}$$

$$x^2 = 60, x = \sqrt{60}$$

Answer $x = 7.75$

8



Rectangles have an area of 36 cm^2 .
Show that the length, l , is inversely proportional to the width, w .
Find the width when the length is 7.5 cm.

$$lw = 36, \text{ so } l = \frac{36}{w}; \frac{36}{7.5}$$

Answer 4.8 cm