

Direct Proportion: $y = kx$ *stretch*

ANSWERS 

1



y is directly proportional to x .
When $x = 15$, $y = 6$. Find a formula for y in terms of x , then find x when $y = 13$.

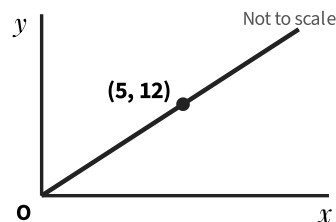
$$6 = 15k, k = 0.4; 13 = 0.4x$$

Answer $y = 0.4x, x = 32.5$

2



The graph shows that y is directly proportional to x . Find y when $x = 18$.



$$k = \frac{12}{5} = 2.4, \text{ so } y = 2.4 \times 18$$

Answer $y = 43.2$

3



y is directly proportional to x^3 .
When $x = 2$, $y = 20$. Find y when $x = 5$.

$$20 = 8k, k = 2.5; 2.5 \times 5^3$$

Answer $y = 312.5$

4



Show that y is directly proportional to x^2 , but not to x . Write a formula for y in terms of x .

x	2	3	5
y	12	27	75

$$\frac{y}{x^2} = 3 \text{ each time, but } \frac{y}{x} \text{ is not}$$

Formula $y = 3x^2$

5



The cost of a square tile, £ C , is directly proportional to the square of its side, s cm. A tile of side 20 cm costs £3.20. Find the cost of a tile of side 35 cm.

$$3.20 = 400k, k = 0.008; 0.008 \times 35^2$$

Answer $\text{£}9.80$

6



The mass, m g, of a metal ball is directly proportional to the cube of its radius, r cm. A ball of radius 2 cm has a mass of 268.8 g. Find the radius of a ball with a mass of 4200 g.

$$268.8 = 8k, k = 33.6$$

$$r^3 = 4200 \div 33.6 = 125$$

Answer 5 cm

7



y is directly proportional to x^2 .
When $x = 3$, $y = 36$. Ola writes $y = 12x$, so when $x = 5$, $y = 60$.
Explain her mistake and find the correct value of y .

$$\text{she used } y = kx, \text{ not } y = kx^2$$

$$36 = 9k, k = 4; 4 \times 25$$

Answer $y = 100$

8



y is directly proportional to x .
Sam says that whenever x goes up by 4, y always goes up by the same amount, wherever x starts.
Is he right? Explain.

$$k(x + 4) - kx = 4k \text{ for every } x$$

Reason $\text{Yes, by } 4k \text{ each time}$