

Q Direct and Inverse Proportion

- 14** y is directly proportional to the square of $(x + 3)$.
When $x = 2, y = 5$.

Find y when $x = 1$.

$y = \dots\dots\dots$ [3]

- 14** y is directly proportional to the square root of $(x - 3)$.
When $x = 28, y = 20$.

Find y when $x = 39$.

$y = \dots\dots\dots$ [3]

- 22 p is directly proportional to $(q+2)^2$.
When $q = 1$, $p = 1$.

Find p when $q = 10$.

$p = \dots\dots\dots$ [3]

- 17 y is proportional to the square of $(x-7)$.
When $x = 12$, $y = 2$.

Find y when $x = 17$.

$y = \dots\dots\dots$ [3]

- 11** y is directly proportional to the cube root of $(x + 3)$.

When $x = 5$, $y = \frac{2}{3}$.

Find y when $x = 24$.

$y = \dots\dots\dots$ [3]

- 16** y is inversely proportional to x^2 .

When $x = 3$, $y = 2$.

Find y when $x = 2$.

$y = \dots\dots\dots$ [3]

- 22** x is inversely proportional to the square root of w .
When $w = 16$, $x = 3$.

Find x in terms of w .

$x = \dots\dots\dots$ [2]

- 13** y varies inversely as $\sqrt{x}$.
When $x = 9$, $y = 2$.

Find y in terms of x .

$y = \dots\dots\dots$ [2]

20

$$y \propto \frac{1}{\sqrt{x}}$$

When $y = 8$, $x = 4$.

Find y when $x = 49$.

$y = \dots\dots\dots$ [3]

- 19 m is inversely proportional to the square of $(t+2)$.
 $m = 0.64$ when $t = 3$.

Find m when $t = 8$.

$m = \dots\dots\dots$ [3]

- 14 y varies inversely as $(x-3)^2$.
When $x = 1$, $y = 4$.

Find y in terms of x .

$y = \dots\dots\dots$ [2]

- 19 y is inversely proportional to the square root of $(x+4)$.
When $x = 5$, $y = 2$.

Find y when $x = 77$.

$y = \dots\dots\dots$ [3]

- 18** y is inversely proportional to the cube root of $(x + 5)$.
When $x = 3$, $y = 12$.

Find y when $x = 22$.

$y = \dots\dots\dots$ [3]

- 24** y is inversely proportional to the cube of $(x - 1)$.
 $y = 9.45$ when $x = 3$.

Find y when $x = 4$.

$y = \dots\dots\dots$ [3]

- 22** y is inversely proportional to the square of $(x + 3)$.
When $x = 5$, $y = 0.375$.

Find y in terms of x .

$$y = \dots\dots\dots [2]$$

20 $y \propto \frac{1}{\sqrt{x}}$

- (a)** When $x = 9$, $y = 2$.

Find the value of y when $x = 36$.

$$y = \dots\dots\dots [3]$$

- (b)** When x is increased by a factor of 4, the value of y changes by a factor of p .

Find the value of p .

$$p = \dots\dots\dots [1]$$

- 7 y varies inversely as x .
When $x = 3$, $y = 16$.

Find x when $y = 6$.

$$x = \dots\dots\dots [3]$$

- 21 The force of attraction, F Newtons, between two magnets is inversely proportional to the square of the distance, d cm, between the magnets.

When $d = 1.5$, $F = 48$.

- (a) Find an expression for F in terms of d .

$$F = \dots\dots\dots [2]$$

- (b) When the distance between the two magnets is doubled the new force is n times the original force.

Work out the value of n .

$$n = \dots\dots\dots [1]$$

- 12** y is inversely proportional to the square root of x .
 v is directly proportional to y^2 .
When $x = 9$, $y = 2$ and $v = 12$.

Find v in terms of x .

Give your answer in its simplest form.

$v = \dots\dots\dots$ [4]

- 18 (a)** y is directly proportional to the cube root of $(x+1)$.
When $x = 7$, $y = 1$.

Find the value of y when $x = 124$.

$y = \dots\dots\dots$ [3]

- (b)** F is inversely proportional to the square of d .

Explain what happens to F when d is halved.

$\dots\dots\dots$ [1]

- 25** w is proportional to the square root of y .
 y is inversely proportional to x .
When $x = 4$, $y = 16$ and $w = 8$.

Find w in terms of x .

$$w = \dots\dots\dots [3]$$

- 23** y is inversely proportional to $\sqrt{x}$ and x is directly proportional to w^2 .
When $w = 12$, $y = 12$.

Find y in terms of w .

$$y = \dots\dots\dots [3]$$

- (e)** The energy of a moving object is directly proportional to the square of its speed.
The speed of the object is increased by 30%.

Calculate the percentage increase in the energy of the object.

$$\dots\dots\dots \% [2]$$