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

Find y when $x = 1$.

$y =$ ..... [3]

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

Find y when $x = 39$.

$y =$ ..... [3]

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

Find p when $q = 10$.

$p =$ ..... [3]

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

Find y when $x = 17$.

$y =$ ..... [3]

11 y is directly proportional to the cube root of $(x+3)$.
When $x = 5$, $y = \frac{2}{3}$.

Find y when $x = 24$.

$y =$ ..... [3]

16 y is inversely proportional to x^2.
When $x = 3$, $y = 2$.

Find y when $x = 2$.

$y =$ ..... [3]

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

Find x in terms of w.

$x =$ ..... [2]

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

Find y in terms of x.

$y =$ ..... [2]

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

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

Find y when $x = 49$.

$y =$ ..... [3]

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

Find m when $t = 8$.

$m =$ ..... [3]

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

Find y in terms of x.

$y =$ ..... [2]

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

Find y when $x = 77$.

$y =$ ..... [3]

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

Find y when $x = 22$.

$y =$ ..... [3]

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

Find y when $x = 4$.

$y =$ ..... [3]

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

Find y in terms of x.

$y =$ ..... [2]

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

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

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

$y =$ ..... [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.

$p =$ ..... [1]

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

Find x when $y = 6$.

$x =$ ..... [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.

$F =$ ..... [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.

$n =$ ..... [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.

$v =$ ..... [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 $x = 124$.

$y =$ ..... [3]

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

Explain what happens to F when d is halved.

..... [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.

$w =$ ..... [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.

$y =$ ..... [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.

..... % [2]