Variation

14 *y* varies inversely as the square of *x*.

y = 1.5 when *x* = 8.

Find *y* when *x* = 5.

Answer y = ... [3]

11 The resistance, *R*, of an object being towed through the water varies directly as the **square** of the speed, *v*.

R = 50 when *v* = 10.

Find *R* when *v* = 16.

Answer R = ... [3]

8 p varies directly as the square root of q.
  $p = 8$ when $q = 25$.

  Find p when $q = 100$.

Answer p = ... [3]

8   Seismic shock waves travel at speed v through rock of density d.
  v varies **inversely** as the **square root** of d.

  $v = 3$ when $d = 2.25$.

  Find v when $d = 2.56$.

Answer v = ... [3]

6   The force, F, between two magnets varies **inversely** as the **square** of the distance, d, between them.

$F = 150$ when $d = 2$.

Calculate F when $d = 4$.

Answer F = ... [3]

16   The time, t, for a pendulum to swing varies directly as the **square root** of its length, l.
When $l = 9, t = 6$.

(a) Find a formula for t in terms of l

Answer(a) t = ... [2]

(b) Find t when $l = 2.25$

Answer(b) t = ... [1]

13 y is **inversely** proportional to x^2.
       When $x = 4$, $y = 3$.

       Find y when $x = 5$.

                                                      Answer y = ... [3]

11 y varies directly as the square of $(x - 3)$.
       $y = 16$ when $x = 1$.

       Find y when $x = 10$.

                                                      Answer y = ... [3]

10 The periodic time, T, of a pendulum varies directly as the square root of its length, l.
$T = 6$ when $l = 9$.

Find T when $l = 25$.

Answer T = ... [3]

The electrical resistance, R, of a length of cylindrical wire varies inversely as the square of the diameter, d, of the wire.
$R = 10$ when $d = 2$.

11
Find R when $d = 4$.

Answer R = ... [3]

13 The mass, m, of an object varies directly as the **cube** of its length, l.

$m = 250$ when $l = 5$.

Find m when $l = 7$.

Answer m = ... [3]

14 y varies inversely as the square root of x.
When $x = 9$, $y = 6$.

Find y when $x = 36$.

Answer y = ... [3]

19 t varies inversely as the square root of u
$t = 3$ when $u = 4$.

Find t when $u = 49$.

Answer t = ... [3]

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

Find y when $x = 4$.

Answer y = ... [3]

8   The mass, m, of a sphere varies directly with the **cube** of its radius, r.
$m = 160$ when $r = 2$.

Find m when $r = 5$.

Answer m = ... [3]

11   The speed, v, of a wave is inversely proportional to the square root of the depth, d, of the water.
$v = 30$ when $d = 400$.

Find v when $d = 25$.

Answer v = ... [3]

8 m varies directly as the cube of x.
$m = 200$ when $x = 2$.

Find m when $x = 0.4$.

Answer m = ... [3]

13 w varies inversely as the square root of x.
When $x = 4$, $w = 4$.

Find w when $x = 25$.

Answer w = ... [3]

11   *y* varies as the cube root of (*x* + 3).
When *x* = 5, *y* = 1.

Find the value of *y* when *x* = 340.

Answer y = ... [3]

13   *y* varies directly with $\sqrt{x + 5}$.
y = 4 when *x* = –1.

Find *y* when *x* = 11.

Answer y = ... [3]

10   The cost of a circular patio, $ C$, varies as the square of the radius, r metres.
$C = 202.80$ when $r = 2.6$.

Calculate the cost of a circular patio with $r = 1.8$.

Answer $ .... [3]

9 y varies inversely as $(x + 5)$.
$y = 6$ when $x = 3$.

Find y when $x = 7$.

Answer y = ... [3]

12 p is inversely proportional to the square of $(q + 4)$.
$p = 2$ when $q = 2$.

Find the value of p when $q = -2$.

Answer p= .... [3]

12 V is directly proportional to the cube of $(r + 1)$.
When $r = 1$, $V = 24$.

Work out the value of V when $r = 2$.

Answer V = ... [3]

17 y is directly proportional to the square of $(x-1)$.
       $y = 63$ when $x = 4$.

   Find the value of y when $x = 6$.

Answer y = ...[3]

19 y is inversely proportional to $(x+2)^2$.
       When $x = 1, y = 2$.

   Find y in terms of x.

Answer y = ... [2]

13 x varies directly as the cube root of y
$x = 6$ when $y = 8$.

Find the value of x when $y = 64$.

Answer x = ... [3]

21 y is directly proportional to the positive square root of x.
When $x = 9, y = 12$.

Find y when $x = \dfrac{1}{4}$

$y =$ .... [3]

16 y is directly proportional to $(x+2)^2$
   When $x = 8$, $y = 250$.

   Find y when $x = 4$.

$y = $ .... [3]

14 y is directly proportional to the square root of $(x + 2)$.
   When $x = 7$, $y = 2$.

   Find y when $x = 98$.

$y = $ .... [3]

1 $V = 4p^2$

Find V when $p = 3$.

$V =$ .... [1]

16 d is inversely proportional to $(w + 1)^2$.
$d = 3.2$ when $w = 4$.

Find d when $w = 7$.

$d =$ .... [3]

15 y is directly proportional to $(x - 1)^2$.
When $x = 5$, $y = 4$.

Find y when $x = 7$.

$y =$ .... [3]