

Past Paper Questions – Proportionality

14.  $y$  is inversely proportional to  $x$ .

When  $x = 3$ ,  $y = 24$ .

(a) Find a formula for  $y$  in terms of  $x$ .

$y = \dots\dots\dots$   
(3)

Hence, or otherwise,

(b) (i) calculate the value of  $y$  when  $x = 6$ ,

$y = \dots\dots\dots$

(ii) calculate the value of  $x$  when  $y = 4.8$

13.  $y$  is directly proportional to the square of  $x$ .

When  $x = 4$ ,  $y = 25$ .

(a) Find an expression for  $y$  in terms of  $x$ .

$\dots\dots\dots$   
(3)

(b) Calculate  $y$  when  $x = 2$ .

$\dots\dots\dots$   
(1)

(c) Calculate  $x$  when  $y = 9$ .

$\dots\dots\dots$   
(2)

17. The kinetic energy,  $E$  joules, of an object moving with a speed  $v$  m/s, is directly proportional to  $v^2$ .

The kinetic energy of the object is 15 480 joules when its speed is 6 m/s.

- (a) Find a formula for  $E$  in terms of  $v$ .

.....  
(3)

- (b) Find the speed of the object when its kinetic energy is 8707.5 joules.

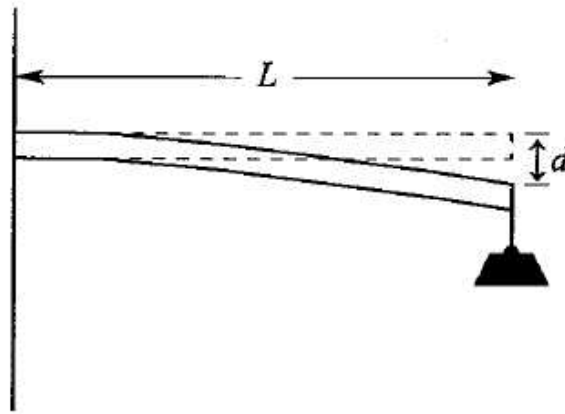
14.  $y$  is inversely proportional to  $x^2$ .  
 $y = 3$  when  $x = 4$ .

- (a) Write  $y$  in terms of  $x$ .

$y =$  .....  
(3)

- (b) Calculate the value of  $y$  when  $x = 5$ .

15.



A weight is hung at the end of a beam of length  $L$ .  
This causes the end of the beam to drop a distance  $d$ .  
 $d$  is directly proportional to the cube of  $L$ .  
 $d = 20$  when  $L = 150$ .

(a) Find a formula for  $d$  in terms of  $L$ .

$d = \dots\dots\dots$   
(3 marks)

(b) Calculate the value of  $L$  when  $d = 15$ .

$L = \dots\dots\dots$   
(2 marks)