Directly and inversely proportional

1. q is inversely proportional to the square of t .When t = 4 , q = 8.5.
   a. Find a formula for q in term of t.

   b. Calculate the value of q when t = 5

2. The distance D , travelled by a particle is directly proportional to the square of the time t taken. When t = 40 , D =30

a. Find a formula for D in term of t.

 Give your answer correct to 3 significant figures.

3. d is directly proportional to the square of t . d = 80 when t = 4
   a. Express d in term of t .

   b. work out the value of d when t = 7

   c. work out the positive value of t when d = 45.

4. If y is proportional to the cube of x , and y = 12 when x =2, find :

   a. y   when x = 8   b .   x when y =96

5. R is inversely proportional to the cube of x , and when x = 3 , R= 8
   Find: a. R when x = 4   b. x when R = 27

 6. The cost C of the building the roof of a house is proportional to the area , A. it has to cover. A roof costs £ 6000 and cover an area of 36 m2.
   Find :
     a. the relationship between C and A .
     b.   the cost of roof to cover an area of 27 m² .
     c.   A roof costs £7500. What area does it cover?

7. A biologist is conducting an experiment to test for a relationship between the surface area of the leaves of a species of plant and the length of the leaf stem.
She has found that the two are related with an inverse square proportionality.
Leaf A has an area of 6.7cm² and a stem length of 2.3cm.
(a) Find a formula linking area and stem length. (Write the constant to 3 significant figures).
(b) Leaf B has an area of 5.2cm². Calculate its stem length to 3 significant figures.