

Direct and Inverse Proportion

26 marks

1. In a factory, chemical reactions are carried out in spherical containers.

The time, T minutes, the chemical reaction takes is directly proportional to the square of the radius, R cm, of the spherical container.

When $R = 120$, $T = 32$

Find the value of T when $R = 150$

$T = \dots\dots\dots$
(Total 4 marks)

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 terms of t .

$D = \dots\dots\dots$
(3)

- (b) Calculate the value of D when $t = 64$

$\dots\dots\dots$
(1)

- (c) Calculate the value of t when $D = 12$
Give your answer correct to 3 significant figures.

.....

(2)

(Total 6 marks)

3. The time, T seconds, it takes a water heater to boil some water is directly proportional to the mass of water, m kg, in the water heater.

When $m = 250$, $T = 600$

- (a) Find T when $m = 400$

$T =$

(3)

The time, T seconds, it takes a water heater to boil a constant mass of water is inversely proportional to the power, P watts, of the water heater.

When $P = 1400$, $T = 360$

- (b) Find the value of T when $P = 900$

$T =$

(3)

(Total 6 marks)

4. r is inversely proportional to t .
 $r = 12$ when $t = 0.2$

Calculate the value of r when $t = 4$.

.....

(Total 3 marks)

5. The weight of a piece of wire is directly proportional to its length.

A piece of wire is 25 cm long and has a weight of 6 grams.
Another piece of the same wire is 30 cm long.

Calculate the weight of the 30 cm piece of wire.

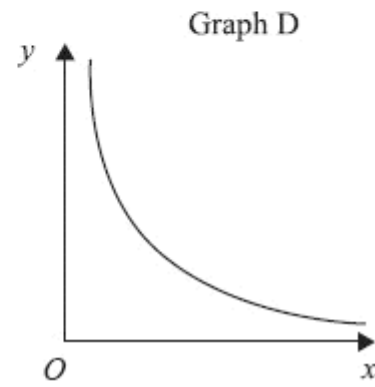
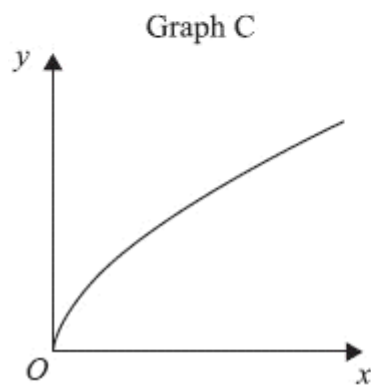
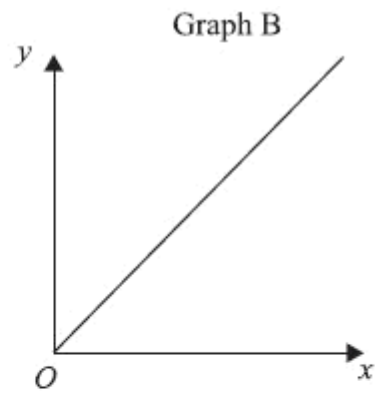
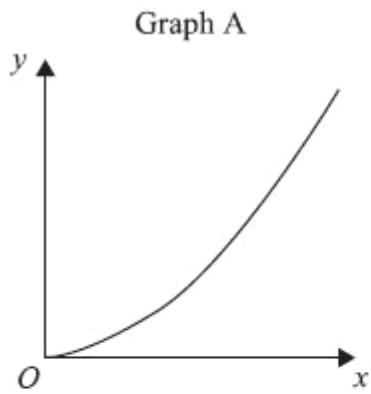
..... grams
(Total 2 marks)

6. p is inversely proportional to m .
 $p = 48$ when $m = 9$

Calculate the value of p when $m = 12$

.....
(Total 2 marks)

7.



For $k > 0$ each graph matches with one of the equations,

$$y = kx \quad y = k\sqrt{x} \quad y = \frac{k}{x} \quad y = kx^2$$

Match each graph to its equation,

Equation	Graph
$y = kx$	
$y = k\sqrt{x}$	
$y = \frac{k}{x}$	
$y = kx^2$	

(Total 3 marks)