![AQA logo]

Topic Test 1 (20 minutes)
Direct and Inverse proportion - Higher

1   Here are three graphs.

Graph A

Distance from home, km (vertical axis, marked 0, 20, 40, 60)
Time, minutes (horizontal axis, marked 0, 30, 60)

Graph B

Distance from home, km (vertical axis, marked 0, 20, 40, 60)
Time, minutes (horizontal axis, marked 0, 30, 60)

Graph C

Distance from home, km (vertical axis, marked 0, 20, 40, 60)
Time, minutes (horizontal axis, marked 0, 30, 60)
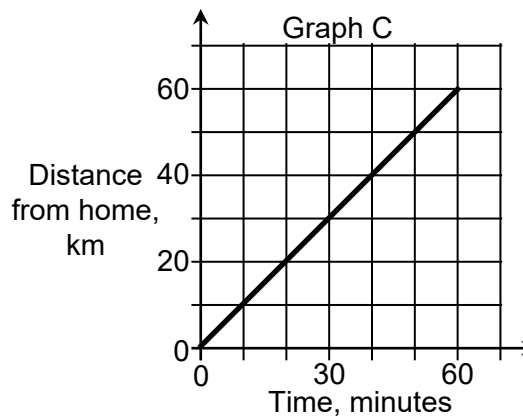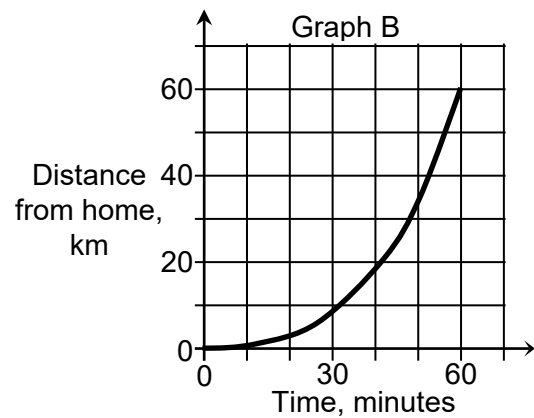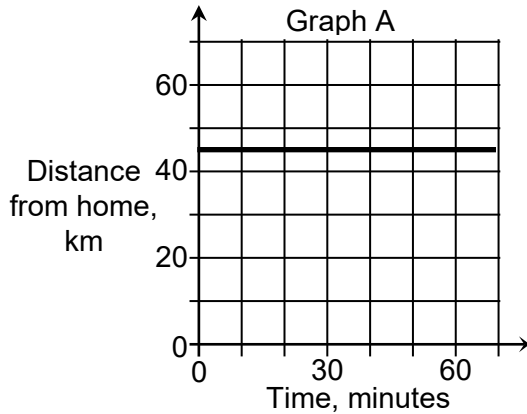
Match each graph to a car.

[2 marks]

Graph ………. shows a car travelling at a steady speed.

Graph ………. shows a car that is not moving.

Graph ………. shows a car whose speed is gradually increasing.

2   For any rectangle   area = length $\times$ width

When the area of a rectangle is doubled and the length is also doubled, what happens to the width?
Circle your answer.
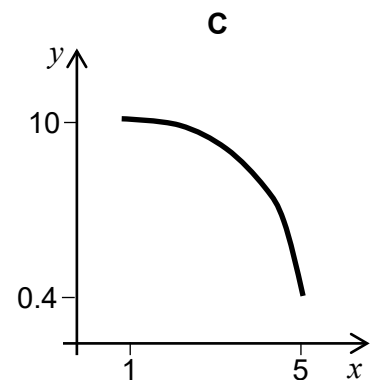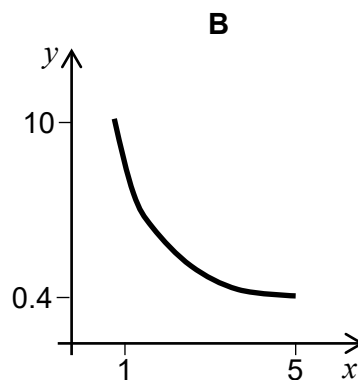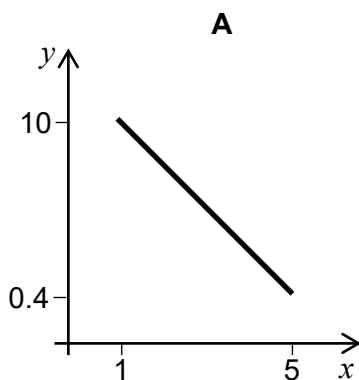
[1 mark]

Doubles   Stays the same   Halves   Quadruples

3 $y = \dfrac{10}{x^2}$ for values of x from 1 to 5

Which sketch graph is correct?
Circle the correct letter.

[1 mark]

4 $y = \dfrac{k}{x^2}$

When $x = 4$, $y = \dfrac{1}{2}$

Work out the value of y when $x = 2$

[2 marks]

Answer _____

5 Ticket sales for a concert go online on a website at 9 am.

There are 2400 tickets for sale.

The number of tickets sold is directly proportional to the number of seconds after 9 am

When Julia logs on 550 tickets have been sold.

The tickets are sold out at 9.08 am

Work out the time that Julia logged on to the website.

[3 marks]

Answer _____ am

6 The mass of a sphere, M, is directly proportional to r^3, where r is the radius of the sphere in cm

When r = 10 cm, M = 200 grams.

Work out the mass of a sphere, made of the same material, with a radius of 15 cm
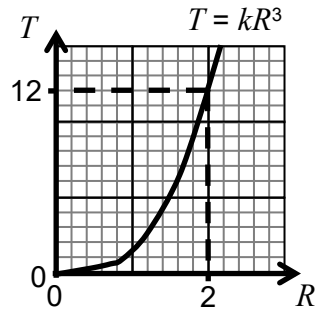
[3 marks]

Answer _____ grams

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7 The graph shows the relationship between T and R.

$T = kR^3$

7 (a) Work out the value of T when $R = 4$

[3 marks]

Answer _____

7 (b) Work out the value of R when $T = 32$
Give your answer to 3 significant figures.

[1 mark]

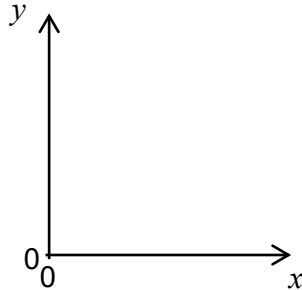Answer _____

8 Sketch the graph of $y = \dfrac{1}{x}$ for positive x values.

y

0

0

x

9 The time, T, taken for a journey of a fixed distance is inversely proportional to the average speed, S.

When $S = S_1$ $T = T_1$
On another journey, the speed S_1 is increased by 40%

Work out the time taken for this journey.

Give your answer as a fraction of T_1

[3 marks]

Answer _____

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