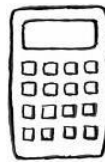


Name:

Teacher
Assessment



Section A **Direct Proportion** **Grade A**

1. A is directly proportional to B^2
When $A = 50$, $B = 10$

(a) Find an equation connecting A and B .

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.....
.....

Answer

(3)

(b) Find the value of B when $A = 72$

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.....
.....

Answer

(2)

(Total 5 marks)

2. The volume, V cubic metres, of a hot-air balloon is proportional to the cube of its height, h metres. A balloon with a height of 10 metres has a volume of 500 cubic metres.

(a) Find an equation connecting V and h .

.....
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.....
.....
.....

Answer

(3)

(b) Find the volume of a hot-air balloon which has a height of 30 metres.

.....
.....

Answer cubic metres

(1)

(c) Another hot-air balloon has a volume of 5000 cubic metres.

Find its height.

.....
.....
.....
.....

Answer metres

(3)

(Total 7 marks)

3. y is directly proportional to the square of x . When $y = 5$, $x = 4$.
Find the value of y when $x = 8$.

.....
.....
.....
.....
.....
.....

Answer

(Total 3 marks)

4. Cheese is sold in different sizes. The weight of each cheese, W kilograms, is proportional to the cube of its height, h centimetres. A cheese of weight 10 kg has a height of 12 cm.

- (a) Find an equation connecting W and h .

.....
.....
.....
.....
.....

Answer

(3)

- (b) Another cheese has a height of 6 cm. Find its weight.

.....

Answer kg

(1)

- (c) Find the height of a cheese that has a weight of 20 kg.

.....
.....
.....
.....
.....

Answer cm

(3)

(Total 7 marks)

5. W and P are both positive quantities.
 W is directly proportional to the square root of P .
When $W = 12$, $P = 16$.

(a) Express W in terms of P .

.....
.....
.....
.....
.....

Answer (3)

(b) What is the value of W when $P = 25$?

.....
.....
.....

Answer (1)

(c) What is the value of P when $W = 21$?

.....
.....
.....

Answer (2)

(Total 6 marks)

6. Rugs are made in different sizes.
The price, £ P , of a rug is proportional to the square of its width, w centimetres.
A rug costing £32 is 80 cm wide.

(a) Find an equation connecting P and w .

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Answer (3)

(b) What is the cost of a rug with width 100 cm?

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.....
.....

Answer £ (1)

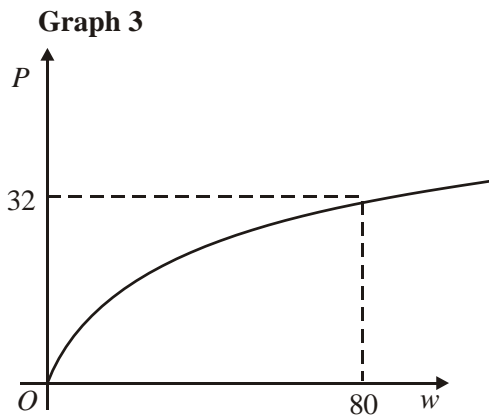
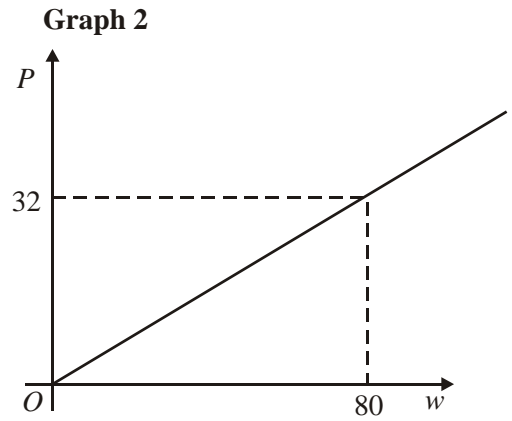
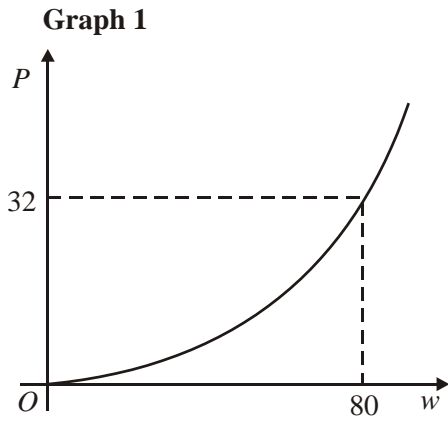
(c) A rug costs £18.

Calculate the width of this rug.

.....
.....
.....

Answer cm (2)

- (d) Which of the graphs below, 1, 2 or 3, correctly represents the relationship between P and w ? Explain your reasoning.



Answer

Reason

.....

(2)
(Total 8 marks)

7. A stone is dropped from rest and falls d metres in t seconds.
The distance the stone falls is proportional to the square of the time it takes to fall.
The stone falls 490 metres in 10 seconds.

(a) Find an equation connecting d and t .

.....
.....
.....

Answer $d =$

(3)

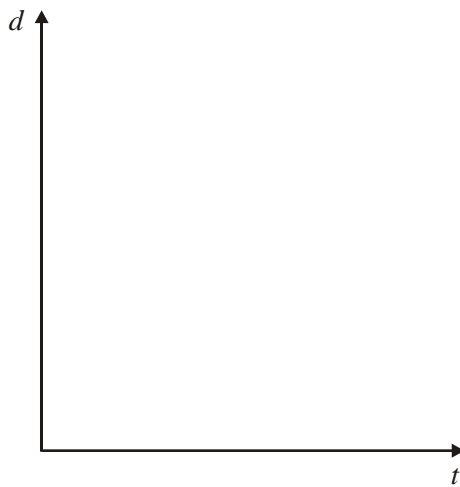
(b) How far does the stone fall in 2.5 seconds?

.....
.....

Answer metres

(1)

(c) Sketch a graph of d against t .



(1)

(Total 5 marks)

8. In an experiment measurements of t and h were taken.

These are the results.

t	2	5	6
h	10	62.5	90

Which of these rules fits the results?

(A) $h \propto t$

(B) $h \propto t^2$

(C) $h \propto t^3$

You **must** show all your working.

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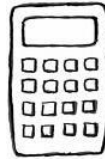
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Answer

(Total 4 marks)

Success:

Target:



Section B **Indirect Proportion** **Grade A***

1. y is inversely proportional to x .
When $y = 16.5$, $x = 20$

(a) Find an equation connecting y and x .

.....
.....
.....
.....

Answer

(3)

(b) Find the value of x when $y = 75$

.....
.....

Answer $x =$

(2)

(Total 5 marks)

2. The volume, v litres, which a fixed mass of gas occupies, is inversely proportional to its pressure, p pascals.

When the pressure is 150 000 pascals, its volume is 5 litres.

- (a) Find an equation connecting v and p .

.....
.....
.....
.....

Answer

(3)

- (b) Find the volume of the gas when the pressure is 250 000 pascals.

.....
.....
.....

Answer litres

(1)

- (c) Find the pressure of the gas when its volume is 300 litres.

.....
.....
.....
.....

Answer pascals

(2)

(Total 6 marks)

3. The illumination, L , provided by a torch is inversely proportional to the square of the distance, d , from the torch.
When $L = 2$, $d = 10$.

(a) Find an equation expressing L in terms of d .

.....
.....
.....
.....

Answer $L =$ (3)

(b) Find the value of L when $d = 2$.

.....
.....

Answer (1)

(c) Find the value of d when $L = 8$.

.....
.....
.....

Answer (2)

(Total 6 marks)

4. y is inversely proportional to the square of x . When $y = 3$, $x = 2$
Find the value of y when $x = 4$

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.....

Answer $y =$ (Total 3 marks)

5. (a) P is inversely proportional to Q . When $P = 100$, $Q = 32$

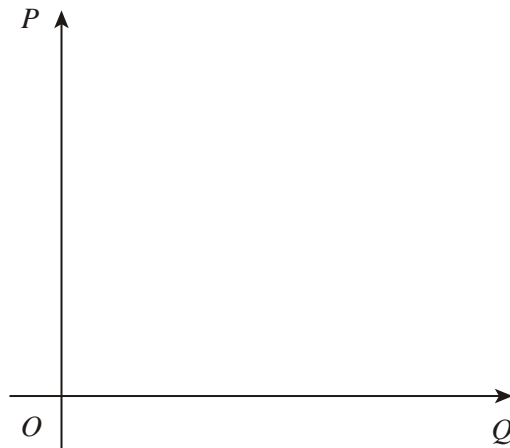
Express P in terms of Q .

.....
.....
.....
.....
.....

Answer

(3)

- (b) P and Q are positive quantities.
Sketch a graph of the relationship between P and Q on this diagram.



(1)

- (c) Calculate the value of Q when P is twice as big as Q .

.....
.....
.....
.....

Answer

(2)

(Total 6 marks)

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

When the magnets are 1.5 cm apart, the force of attraction is 28 Newtons.

- (a) Find an equation connecting F and d .

.....
.....
.....
.....

Answer

(3)

- (b) What is the distance between the magnets when the force of attraction is 43.75 Newtons?

.....
.....
.....
.....

Answercm

(2)

(Total 5 marks)

7. y is inversely proportional to the square root of x .

When $x = 16$, $y = 2$

What is the value of y when $x = 0.25$?

.....
.....
.....
.....
.....
.....

Answer

(Total 3 marks)

8. In an experiment measurements of t and m were taken.
The results were as follows:

t	2	2.4	3
m	36	25	16

The results are connected by one of these rules.

A $t \propto \sqrt{m}$

B $t \propto \frac{1}{m}$

C $t \propto \frac{1}{\sqrt{m}}$

Which rule is the correct one?
State your answer clearly.
You **must** show your working.

.....
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.....
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Answer

(Total 4 marks)

Success:

Target: