



Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need*.
- **Calculators may be used.**

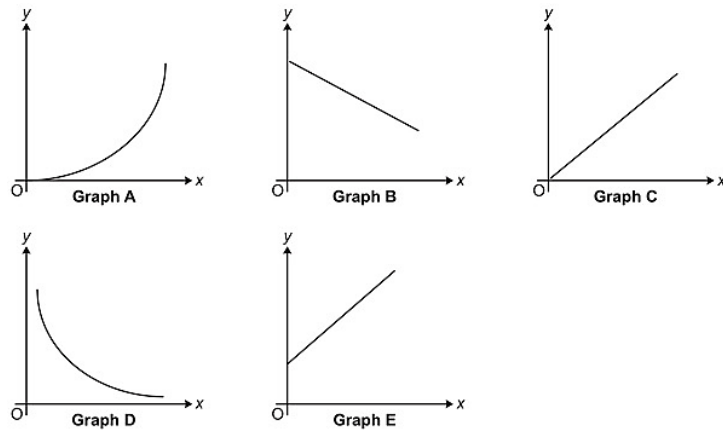
Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Here are sketches of five graphs.



Write the letter of the graph that represents the following relationships:

(a) y is inversely proportional to x .

D

(b) y is directly proportional to x .

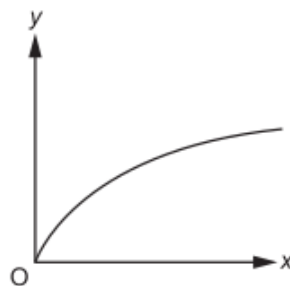
C

(c) y is not proportional to x .

E

(3 marks)

A graph is drawn below.

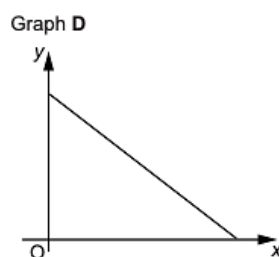
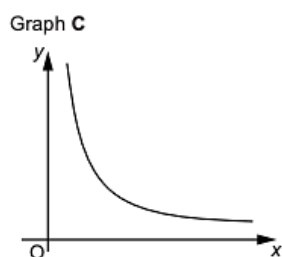
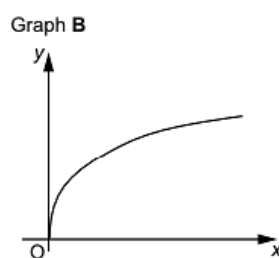
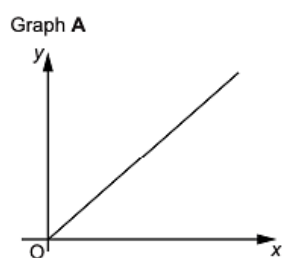


Explain how you know that y is not directly proportional to x .

IT ISN'T A STRAIGHT
LINE.

(1 mark)

These graphs show different relationships between the variables x and y .



Write the letter of the graph that represents the following relationships:

(a) y is inversely proportional to x .

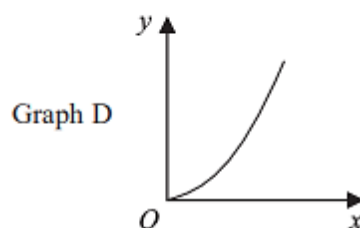
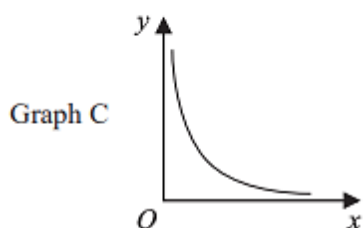
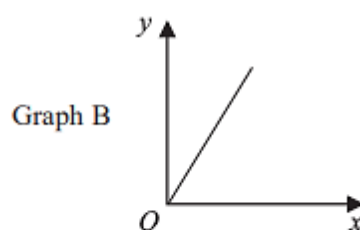
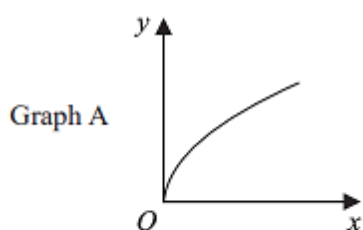
C

(b) y is directly proportional to x .

A

(2 marks)

The graphs of y against x represent four different types of proportionality.



Match each type of proportionality in the table to the correct graph.

Type of proportionality	Graph letter
$y \propto x$	B
$y \propto x^2$	D
$y \propto \sqrt{x}$	A
$y \propto \frac{1}{x}$	C

A, A, A

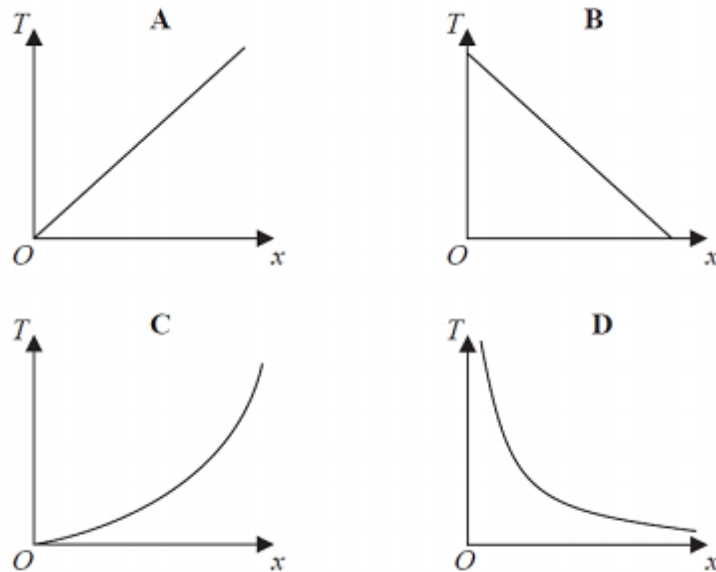
(2 marks)

Q5.

AtoZrevision.com

At a depth of x metres, the temperature of the water in an ocean is $T^{\circ}\text{C}$.
At depths below 900 metres, T is inversely proportional to x .

Here are four graphs.



Which graph could show that T is inversely proportional to x ?

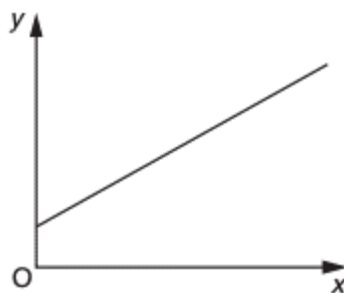
D

(1 mark)

Q6.

AtoZrevision.com

A graph is drawn below.



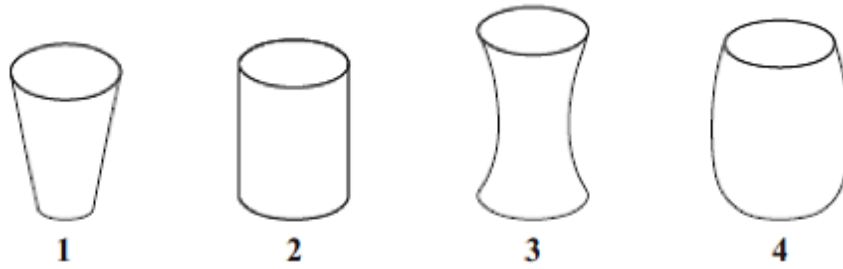
Explain how you know that y is not directly proportional to x .

LINE DOESN'T GO THROUGHT
THE ORIGIN.

(1 mark)

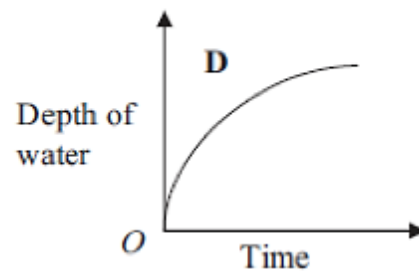
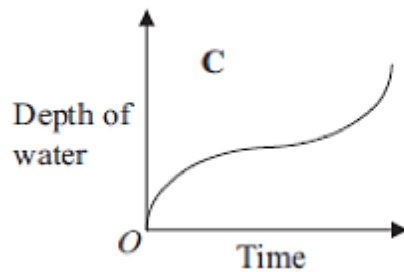
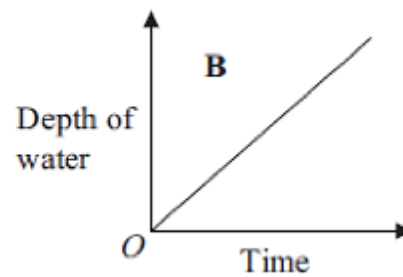
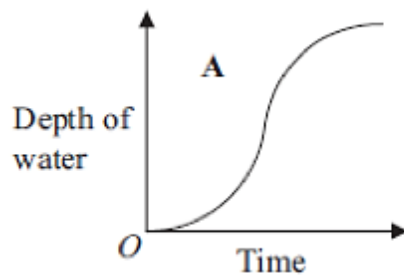
Here are four containers.

Water is poured into each container at a constant rate.



Here are four graphs.

The graphs show how the depth of the water in each container changes with time.



Match each graph with the correct container.

M.
TWO
CORRECT

C AND 4

A AND 3

D AND 1

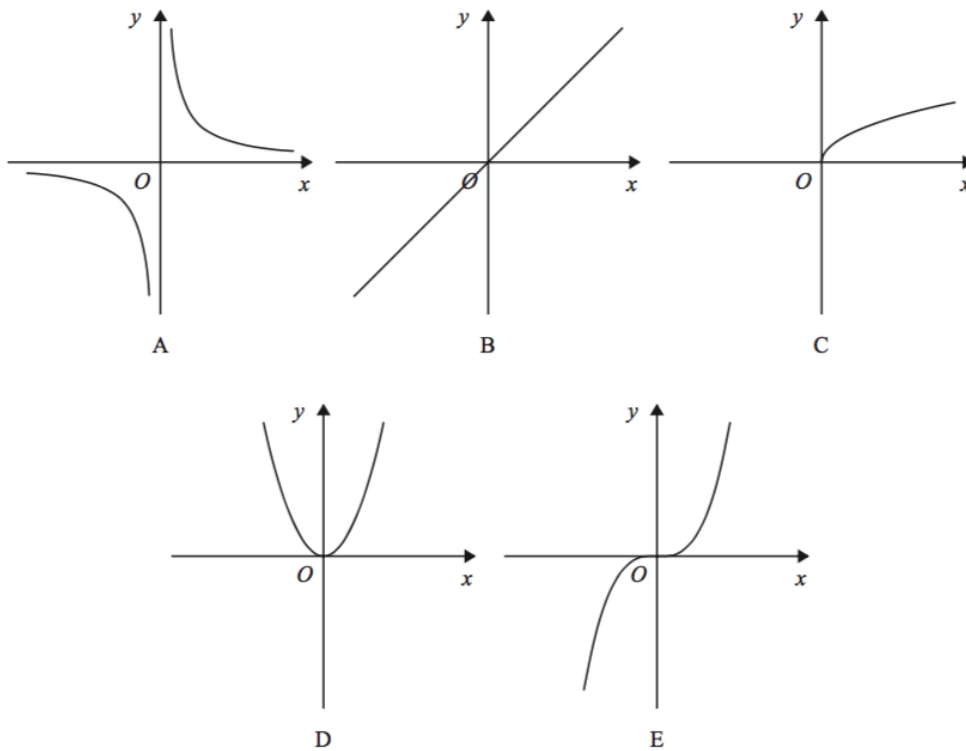
B AND 2

A1 **FOUR CORRECT**

(2 marks)

Here are five graphs.

Each graph shows either direct proportion or inverse proportion.



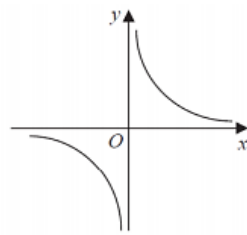
The table shows five equations. Match the letter of each graph to its equation.

Equation	Graph
$y = kx^3$	E
$y = k\sqrt{x}$	C
$y = kx^2$	D
$y = \frac{k}{x}$	A
$y = kx$	B

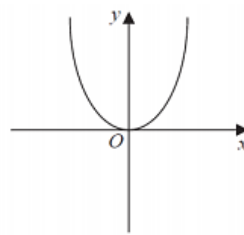
(A₁) 1 CORRECT
 (A₁) 3 CORRECT
 (A₁) 5 CORRECT

(3 marks)

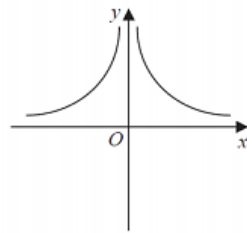
These graphs show four different proportionality relationships between y and x .



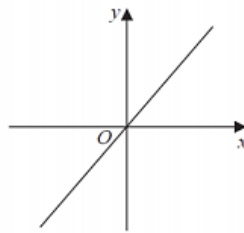
Graph A



Graph B



Graph C



Graph D

Match each graph with a statement in the table below.

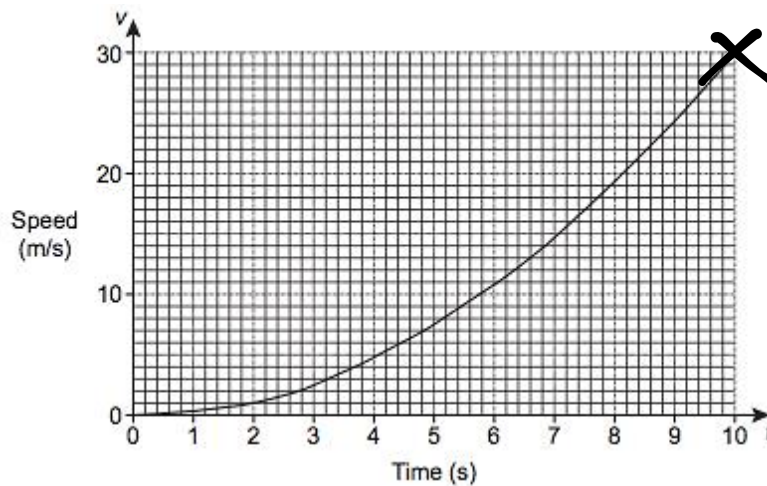
Proportionality relationship	Graph letter
y is directly proportional to x	D
y is inversely proportional to x	A
y is proportional to the square of x	B
y is inversely proportional to the square of x	C

A₁

A₁

(2 marks)

The graph shows the speed, v metres per second (m/s), of a car at time t seconds.



The speed of this car is directly proportional to the square of the time.

Find a formula linking v and t .

$$S = k t^2 \quad (M_1)$$

PICK A POINT ON THE GRAPH
(10, 30) (M_1)

$$30 = k \times 100$$

$$k = \frac{3}{10}$$

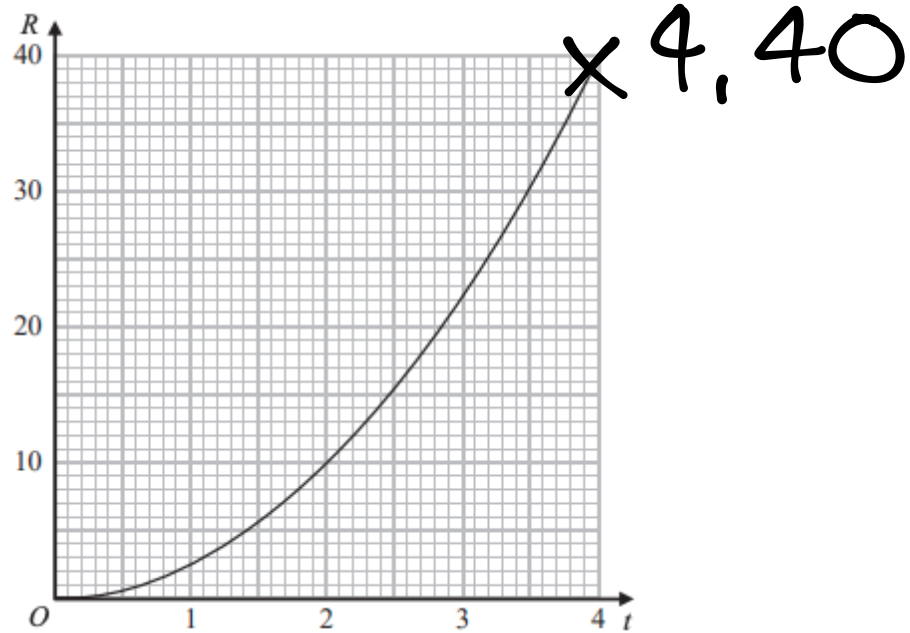
$$\therefore S = 0.3 t^2 \quad (A_1)$$

(3 marks)

R is proportional to t^2

$$R = kt^2 \quad (M_1)$$

The graph shows the relationship between R and t for $0 \leq t \leq 4$



Find a formula for R in terms of t .

$$40 = k \times 16 \quad (M_1)$$

$$\frac{40}{16} = \frac{5}{2} = k$$

$$\therefore R = \frac{5}{2} t^2 \quad (A_1)$$

(3 marks)