

Name: _____

GCSE (1 – 9)

Trig and Exponential Graphs

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

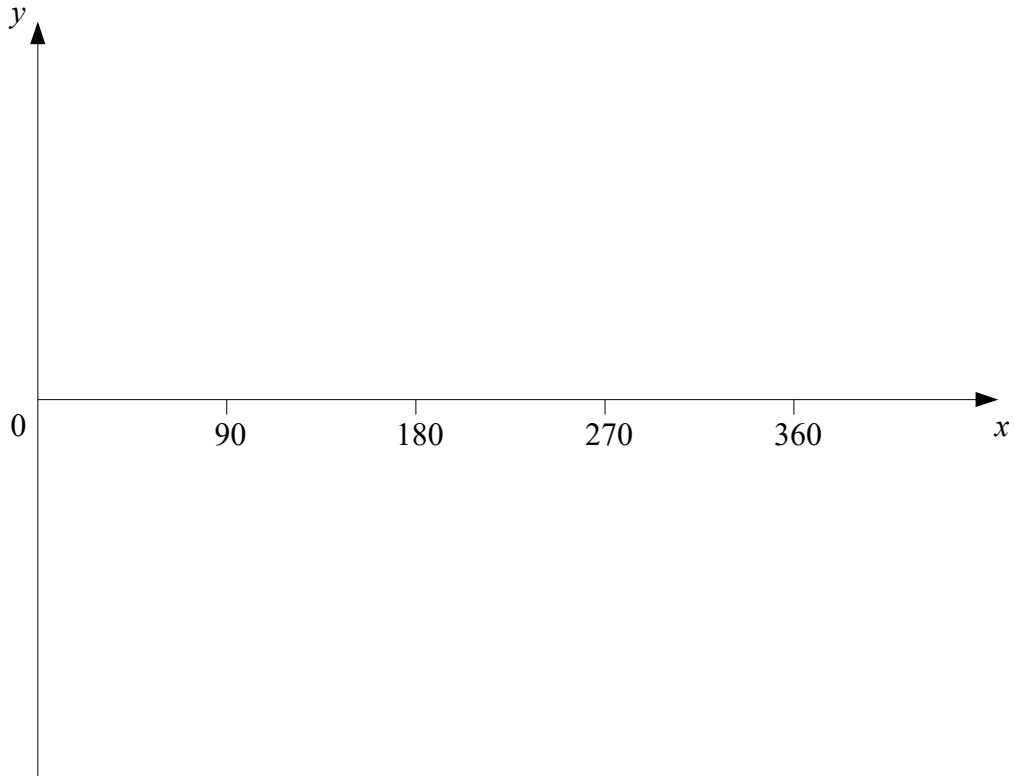
Information

- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

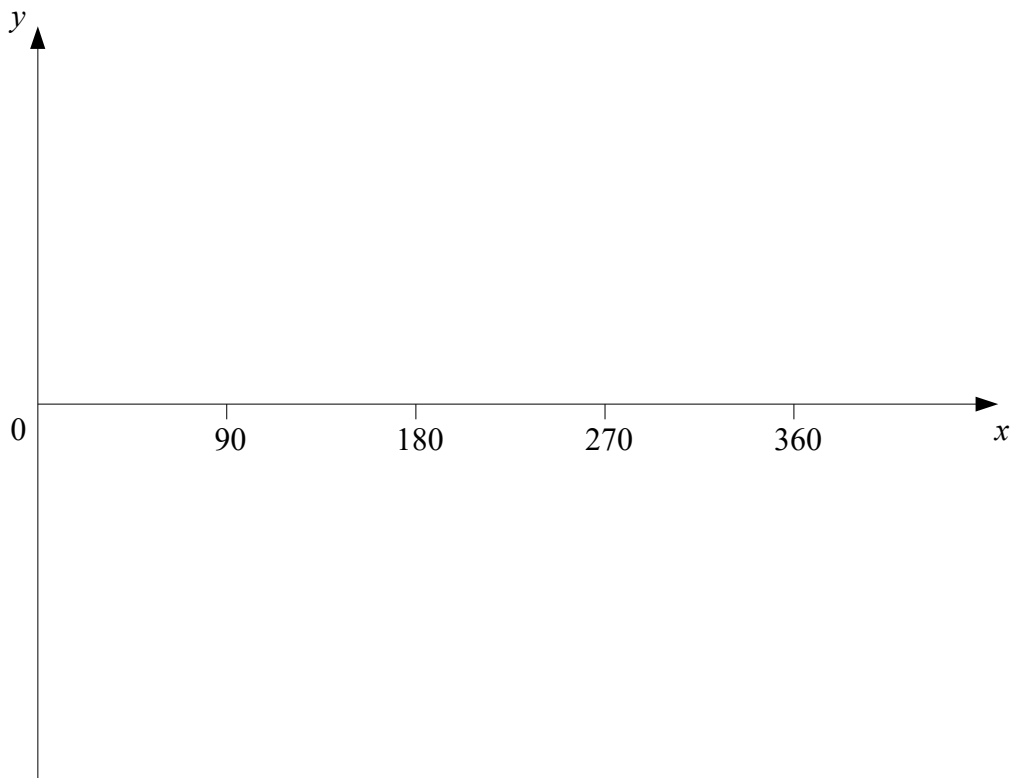
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1 Sketch the graph of $y = \sin x^\circ$ for $0 \leq x \leq 360$



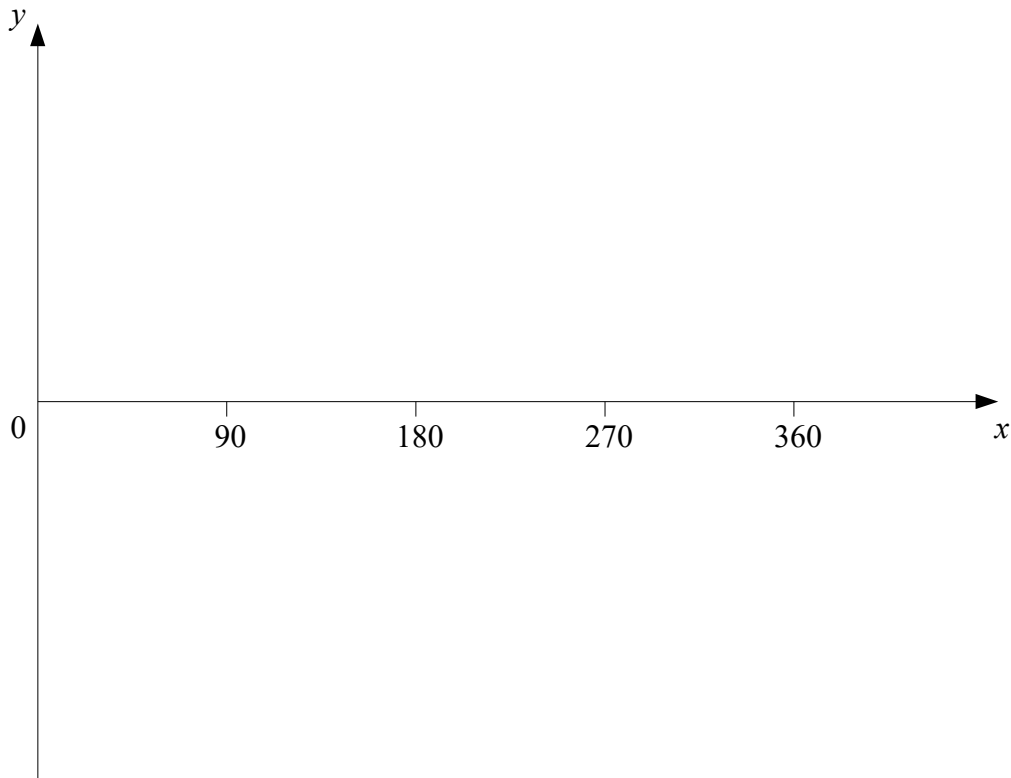
(Total for Question 1 is 2 marks)

2 Sketch the graph of $y = \tan x^\circ$ for $0 \leq x \leq 360$



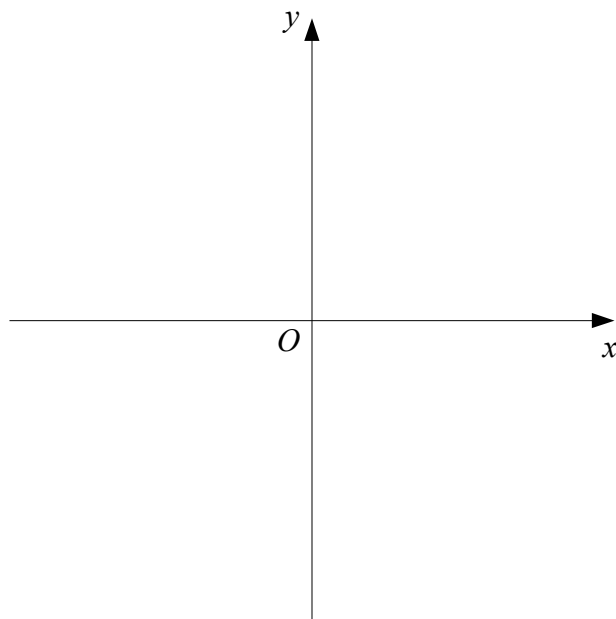
(Total for Question 2 is 2 marks)

3 Sketch the graph of $y = \cos x^\circ$ for $0 \leq x \leq 360$



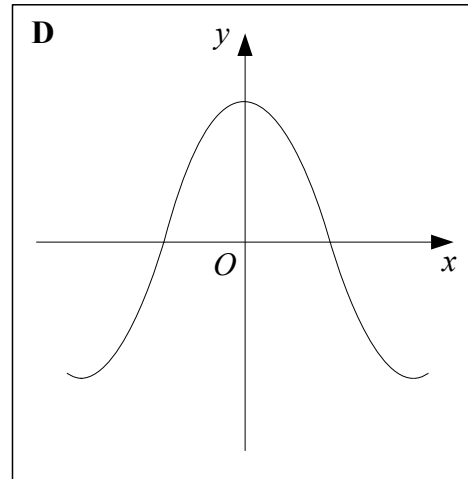
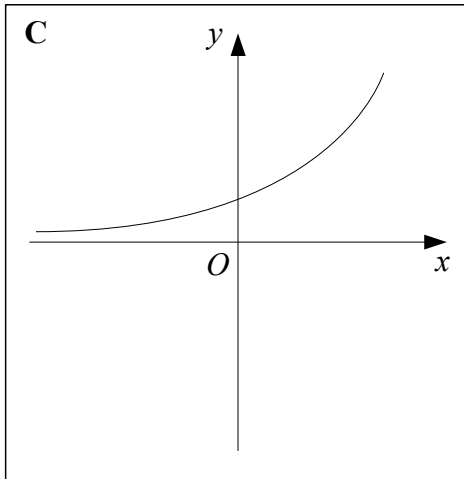
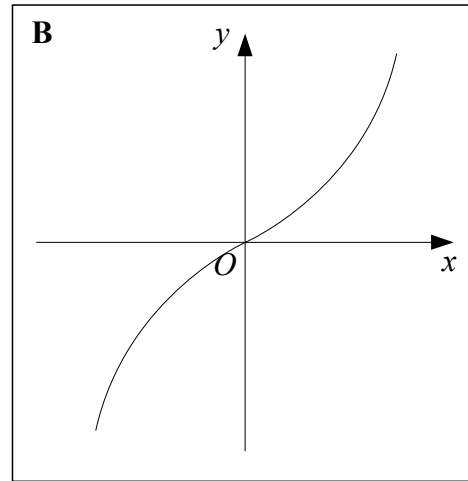
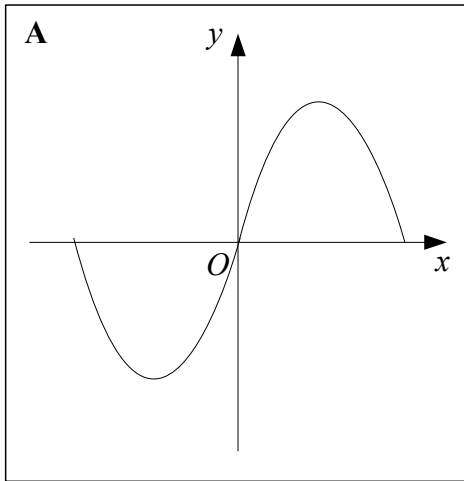
(Total for Question 3 is 2 marks)

4 On the grid, sketch the curve with equation $y = 2^x$
Give the coordinates of any points of intersection with the axes.



(Total for Question 4 is 2 marks)

5 Here are four graphs

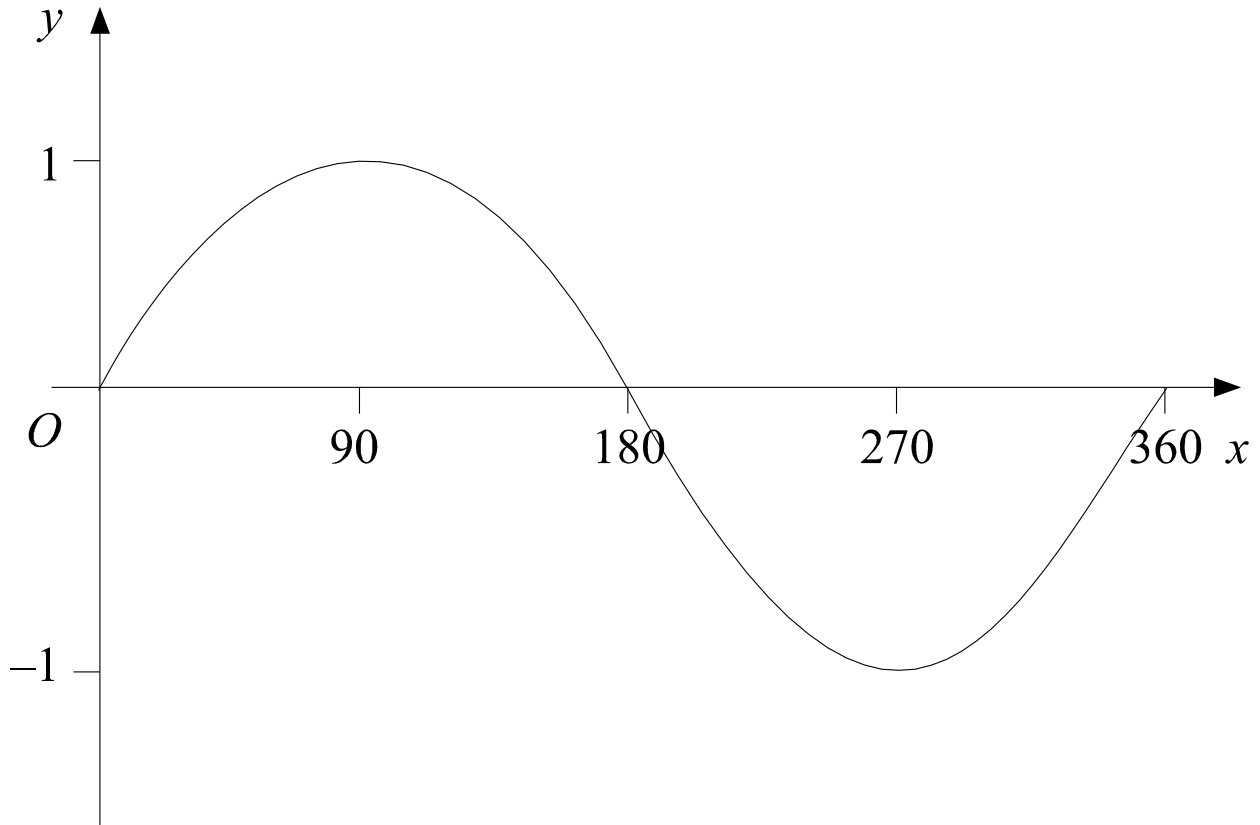


In the table below, match each equation with the letter of its graph.

Equation	Letter of Graph
$y = \sin x$	
$y = 2^x$	
$y = x^3$	
$y = \cos x$	

(Total for Question 5 is 2 marks)

6 Here is a sketch of the curve $y = \sin x^\circ$ for $0 \leq x \leq 360$



Given that $\sin 30^\circ = \frac{1}{2}$ write down the value of:

i) $\sin 150^\circ$

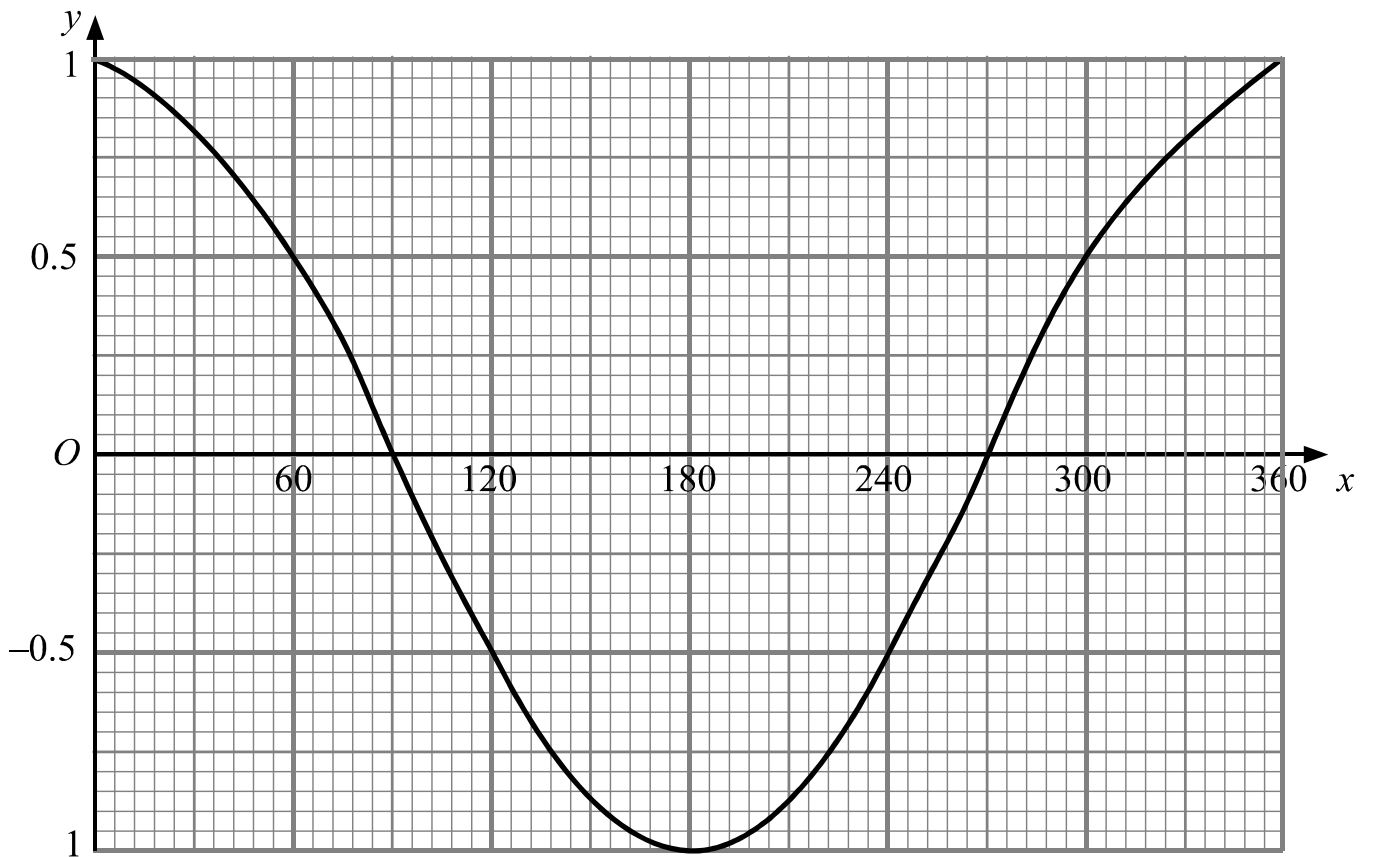
.....
(1)

ii) $\sin 330^\circ$

.....
(1)

(Total for Question 6 is 2 marks)

7 Here is a sketch of the curve $y = \cos x^\circ$ for $0 \leq x \leq 360$



Use the graph to find estimates of the solutions, in the interval $0 \leq x \leq 360$, of the equation:

i) $\cos(x) = -0.4$

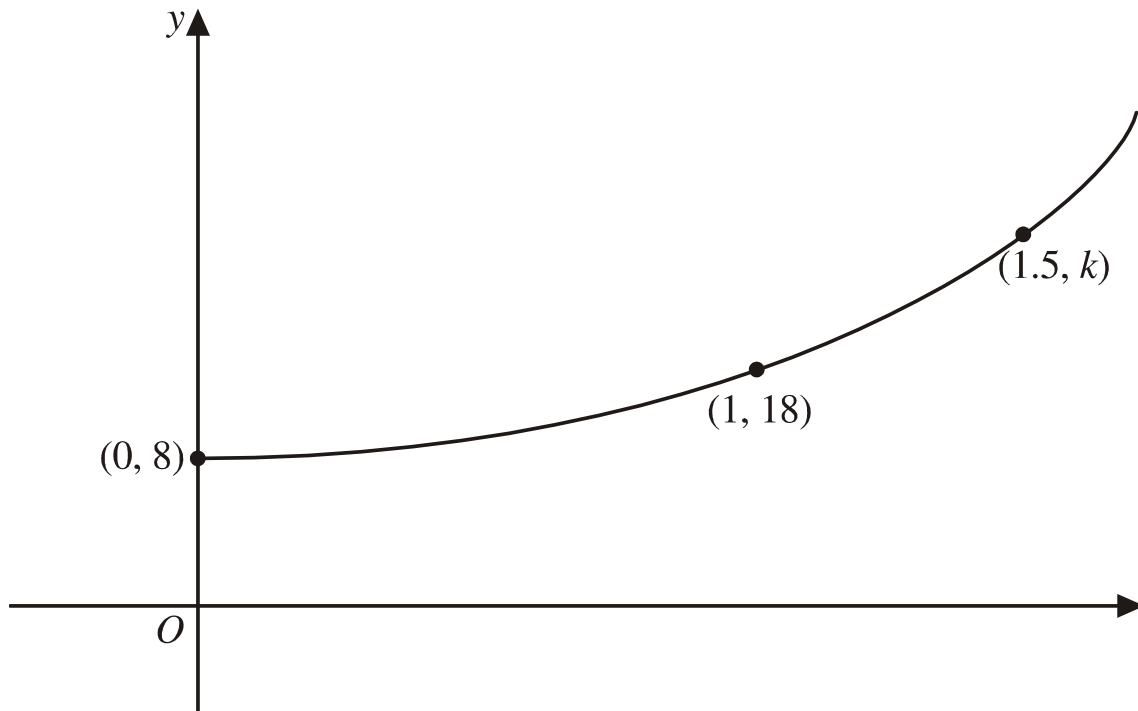
..... (2)

ii) $4 \cos(x) = 3$

..... (2)

(Total for Question 7 is 4 marks)

- 8 This sketch shows part of the graph with equation $y = pq^x$ where p and q are constants.



The points with coordinates $(0, 8)$, $(1, 18)$ and $(1.5, k)$ lie on the graph.

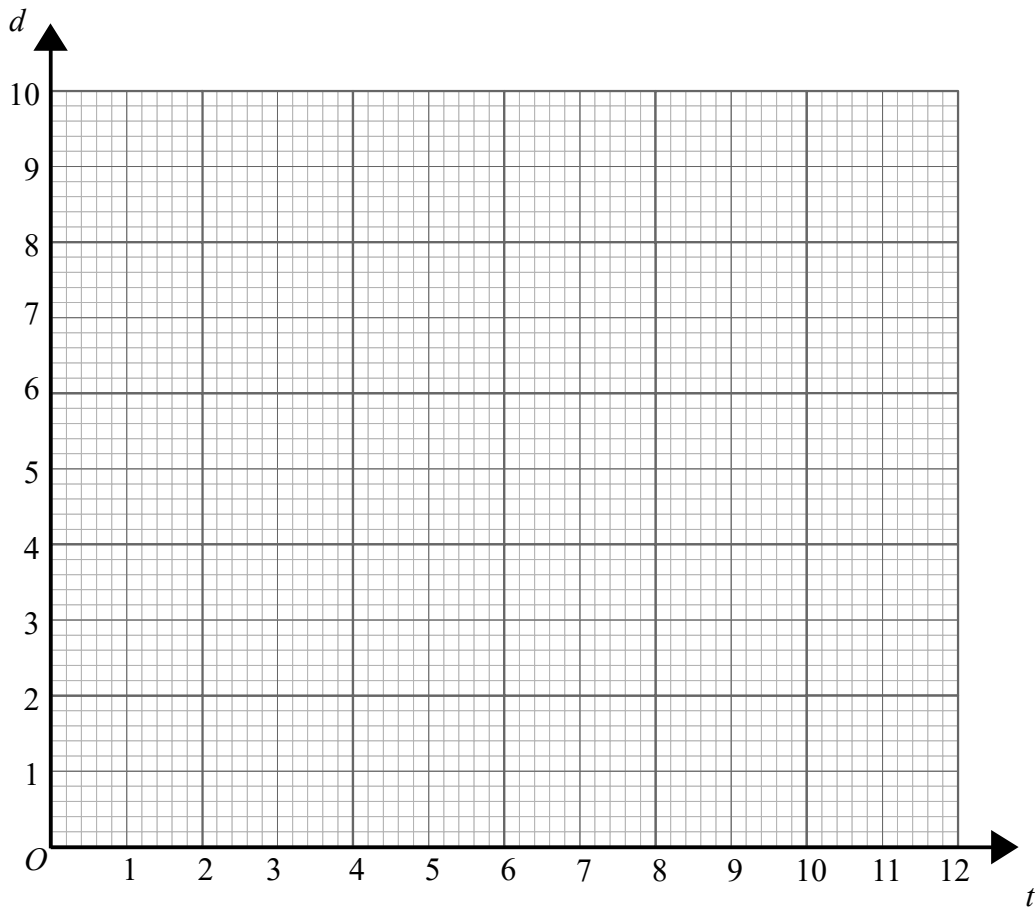
Calculate the values of p , q and k .

(Total for Question 8 is 6 marks)

9 The depth of water, d metres, at the entrance to a harbour is given by the formula:
 $d = 5 - 4\sin(30t)$, where t is the time in hours after midnight on one day.

(a) On the axes below, draw the graph of d against t for $0 \leq t \leq 12$

(4)



(b) Find the two values of t , where $0 \leq t \leq 24$, when the depth is least.

..... and

(2)

(Total for Question 9 is 6 marks)