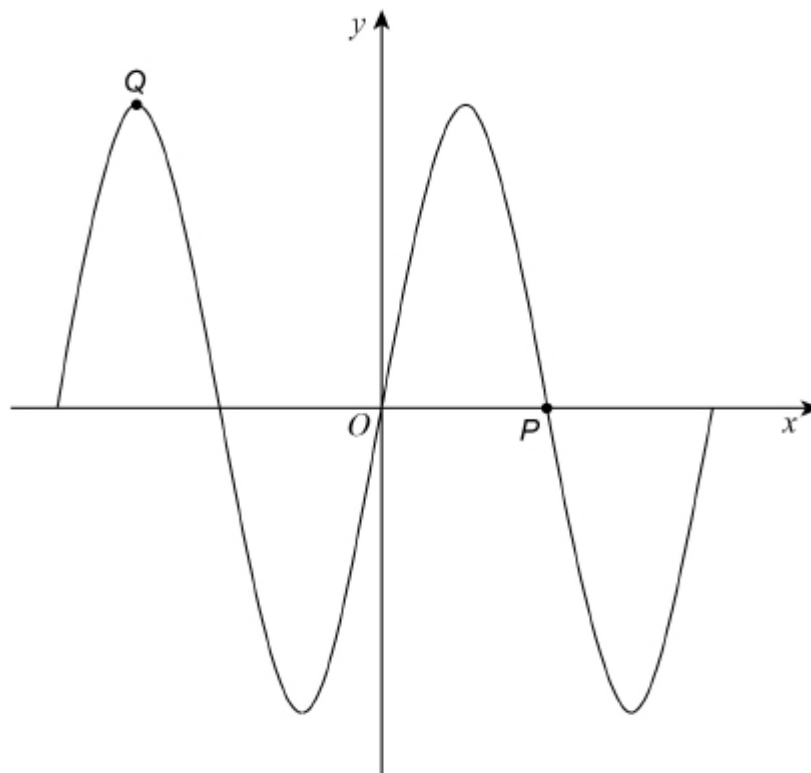


Non-Calculator

Q1.

Here is a sketch of $y = \sin x^\circ$ for $-360 \leq x \leq 360$



(a) Write down the coordinates of P .

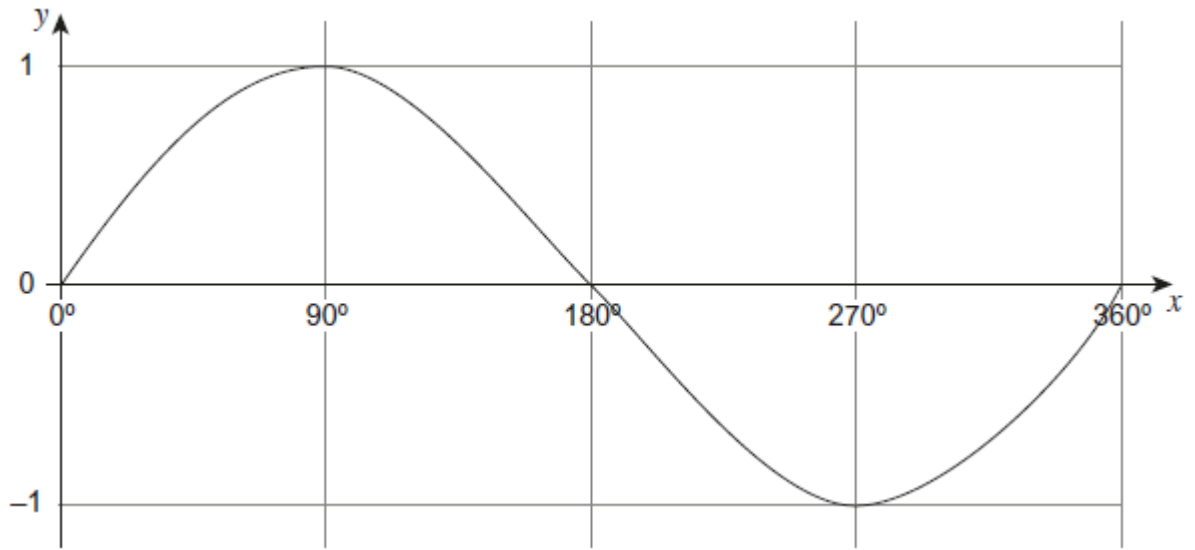
Answer (_____ , _____)
(1)

(b) Write down the coordinates of Q .

Answer (_____ , _____)
(1)
(Total 2 marks)

Q2.

This is a sketch graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$



(a) Write down the number of solutions for $\sin x = 0.5$ for $0^\circ \leq x \leq 360^\circ$

Answer _____

(1)

(b) $\sin x = \sin 10$

Write down the value of x for $90^\circ \leq x \leq 180^\circ$

Answer _____

(1)

(Total 2 marks)

Q3.

Which of these values **cannot** be the cosine of an angle?
Circle your answer.

-0.5

0

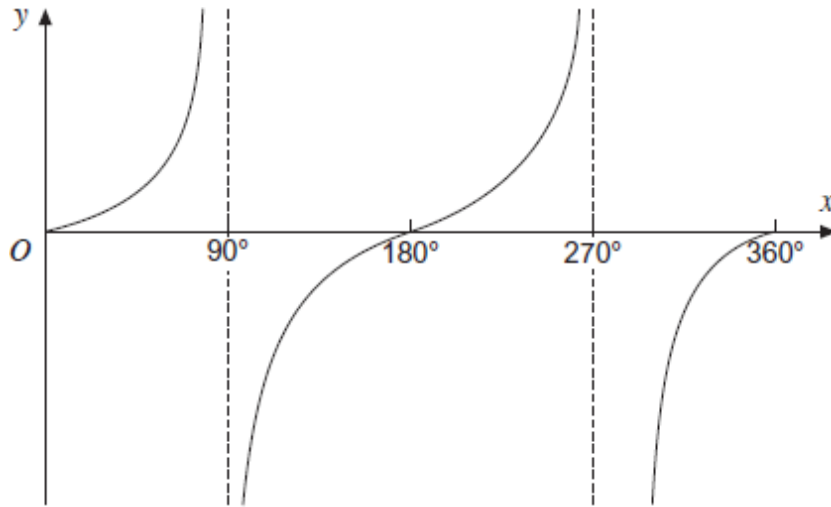
0.5

1.5

(Total 1 mark)

Q4.

(a) Circle a possible equation for the graph shown below.



$y = \frac{1}{x}$

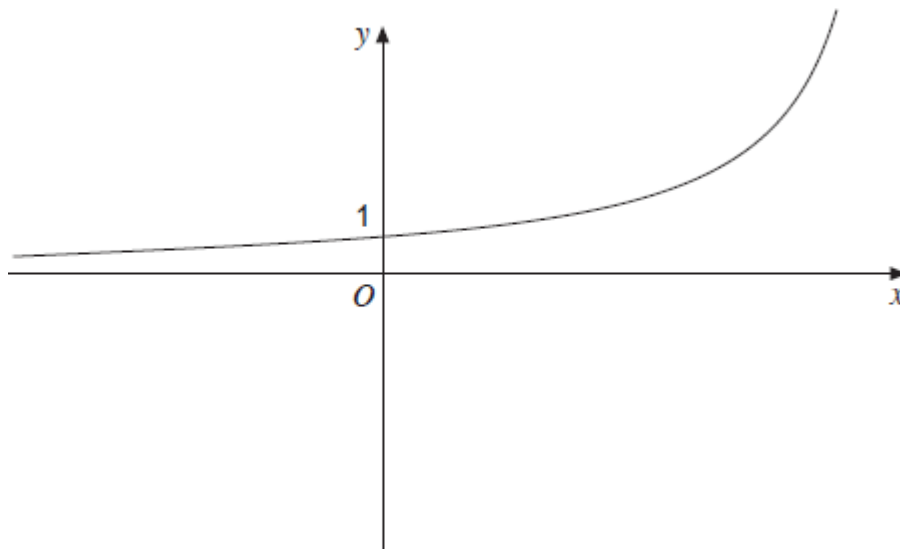
$y = \sin x$

$y = 2^x$

$y = \tan x$

(1)

(b) Circle a possible equation for the graph shown below.



$y = \frac{1}{x}$

$y = \sin x$

$y = 2^x$

$y = \tan x$

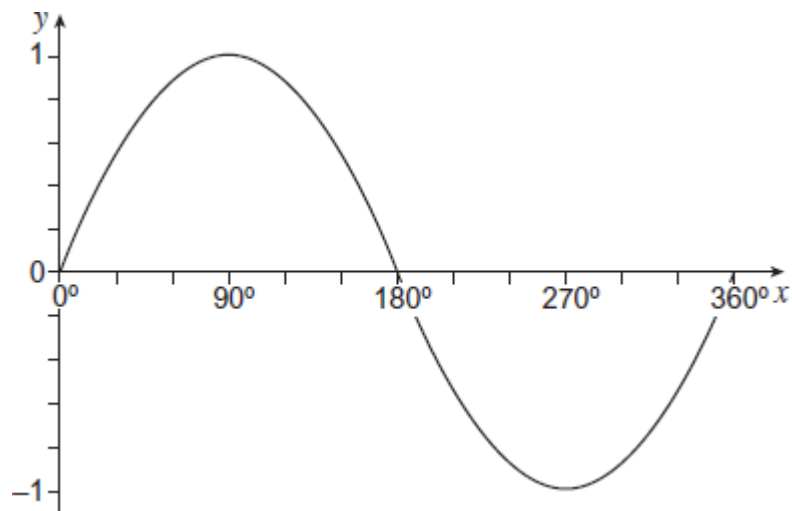
(1)

(Total 2 marks)

Calculator

Q5.

The graph shows $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$



(a) $\sin x = \sin 60^\circ$ and $90^\circ < x < 360^\circ$

Work out the value of x .

Answer _____

(1)

(b) $\sin x = -\sin 60^\circ$ and $180^\circ < x < 360^\circ$

Work out **one** of the values of x .

Answer _____

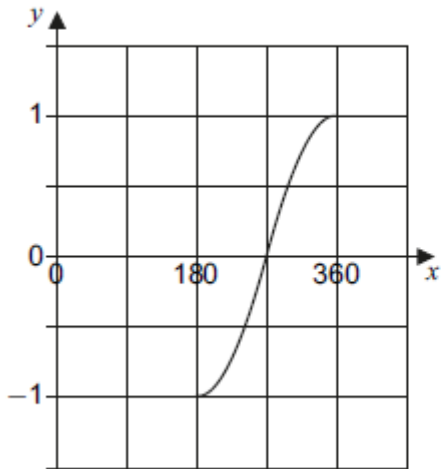
(1)

(Total 2 marks)

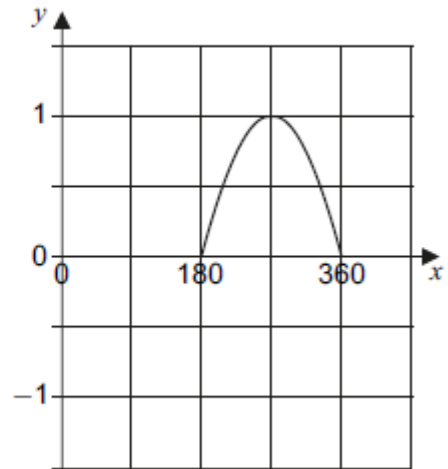
Q6.

Four graphs are shown for $180^\circ \leq x \leq 360^\circ$

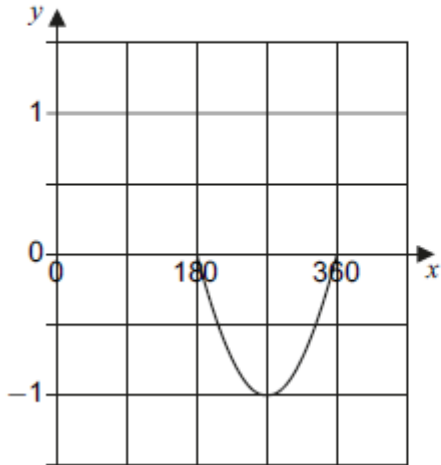
Graph A



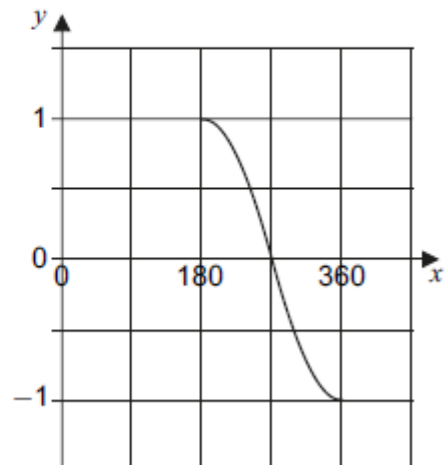
Graph B



Graph C



Graph D



(a) Which graph is $y = \sin x$?

Graph _____ (1)

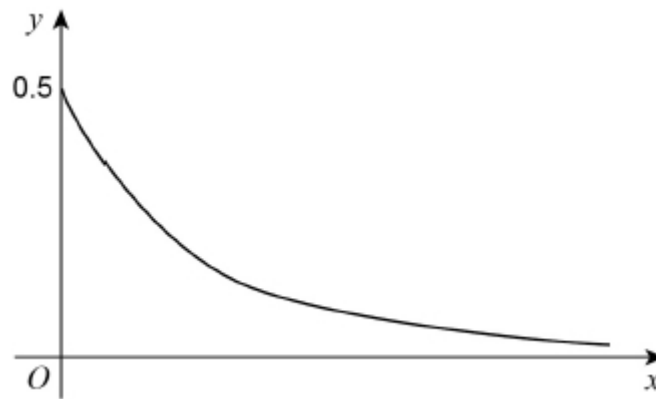
(b) Which graph is $y = \cos x$?

Graph _____ (1)

(Total 2 marks)

Q7.

Nick sketches the graph of $y = 0.5^x$ for $x \geq 0$

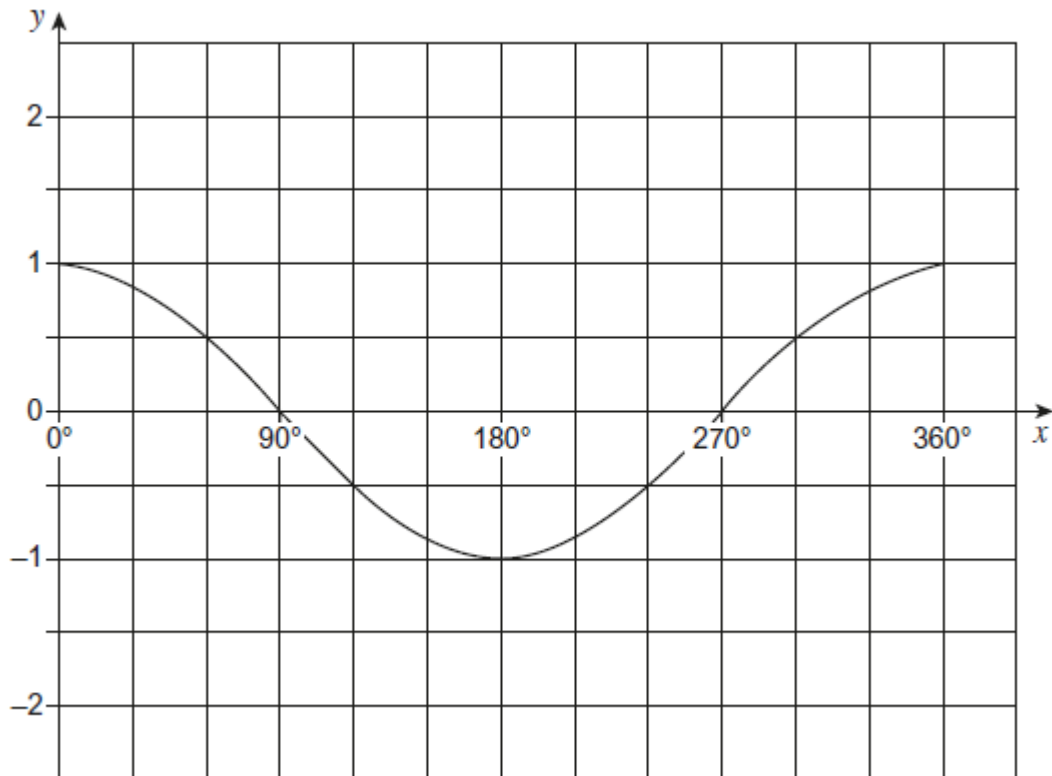


Make **one** criticism of his sketch.

(Total 1 mark)

Q8.

The graph $y = \cos x$ for $0^\circ \leq x \leq 360^\circ$ is shown.



Write down the **two** solutions to the equation $\cos x = 0.5$ for $0^\circ \leq x \leq 360^\circ$

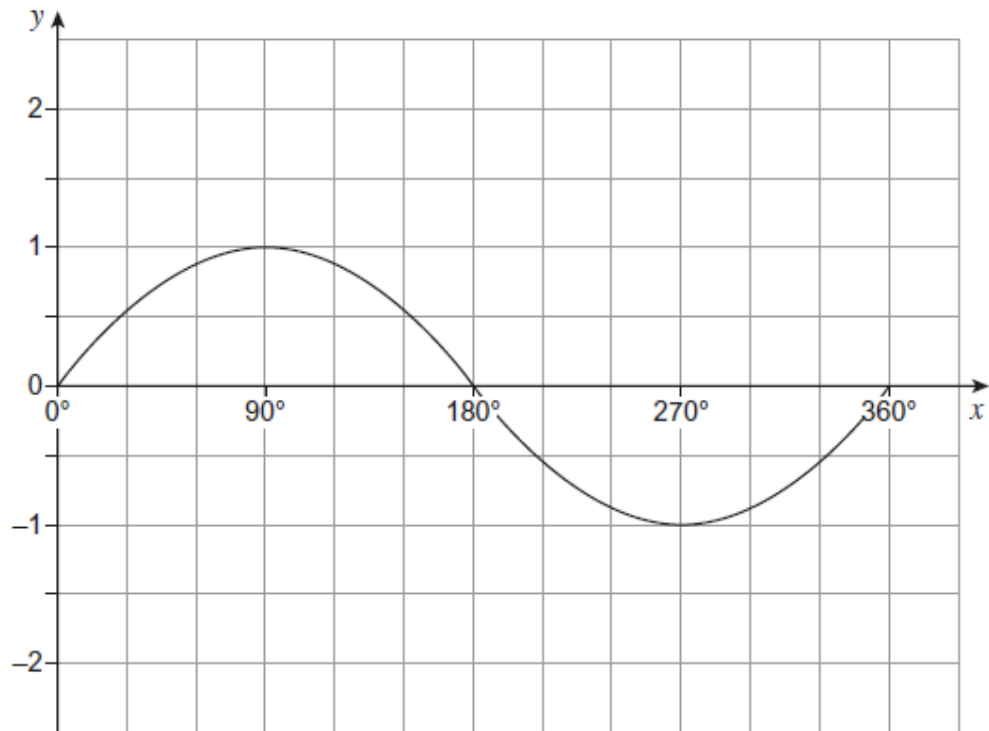
Answer _____ degrees

and _____ degrees

(Total 1 mark)

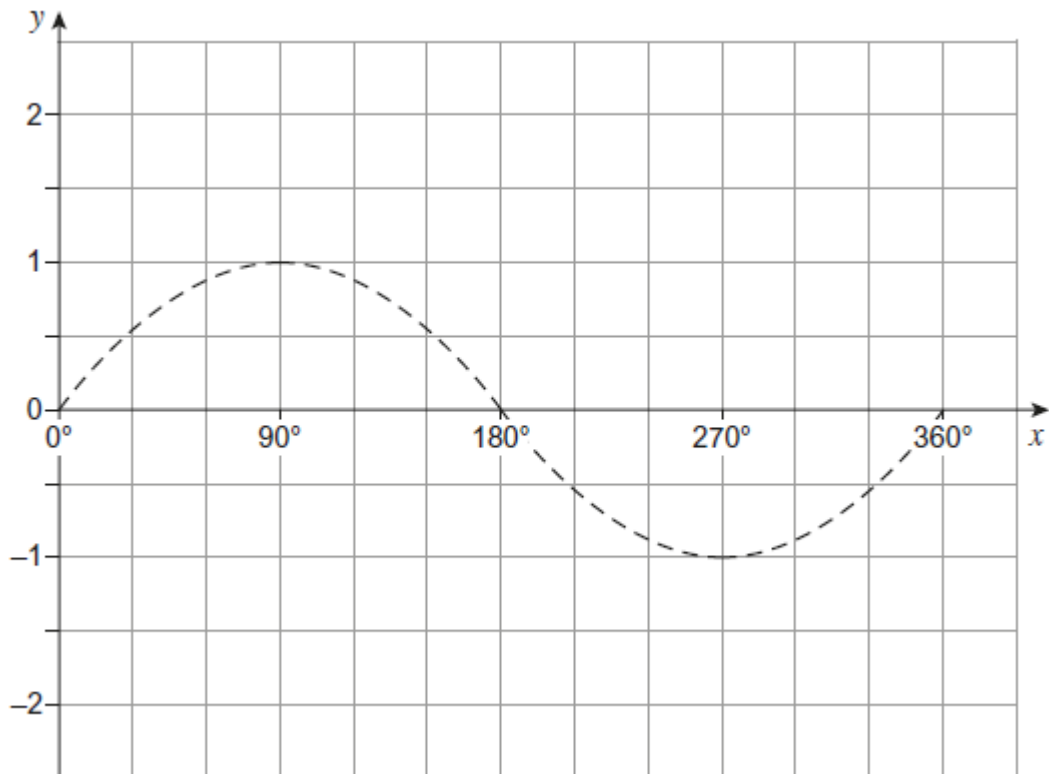
Q9.

The graph of $y = \sin x$ for $0^\circ \leq x \leq 360^\circ$ is shown.



- (a) On the grid below, draw the graph of $y = 1 + \sin x$ for $0^\circ \leq x \leq 360^\circ$

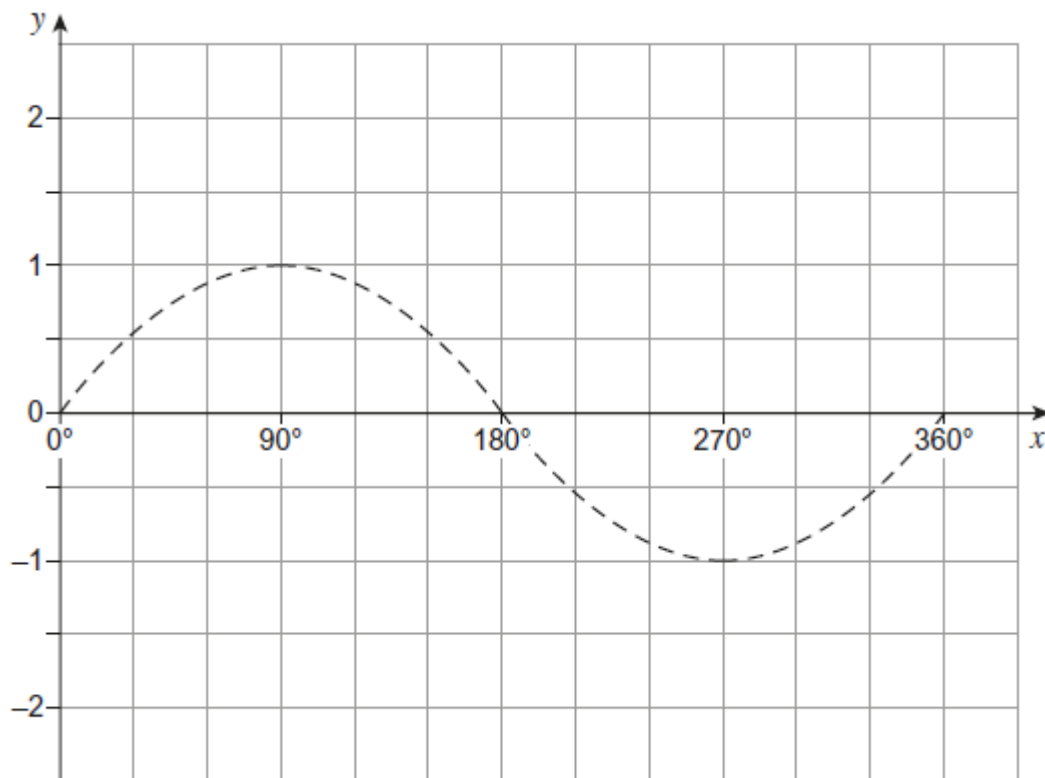
The graph of $y = \sin x$ is shown to help you.



(1)

(b) On the grid below, draw the graph of $y = \sin(x + 90^\circ)$ for $0^\circ \leq x \leq 360^\circ$

The graph of $y = \sin x$ is shown to help you.



(1)

(Total 2 marks)

Q10.

The depth of water, d metres, in a harbour at a time, t hours after 12 noon, is given by

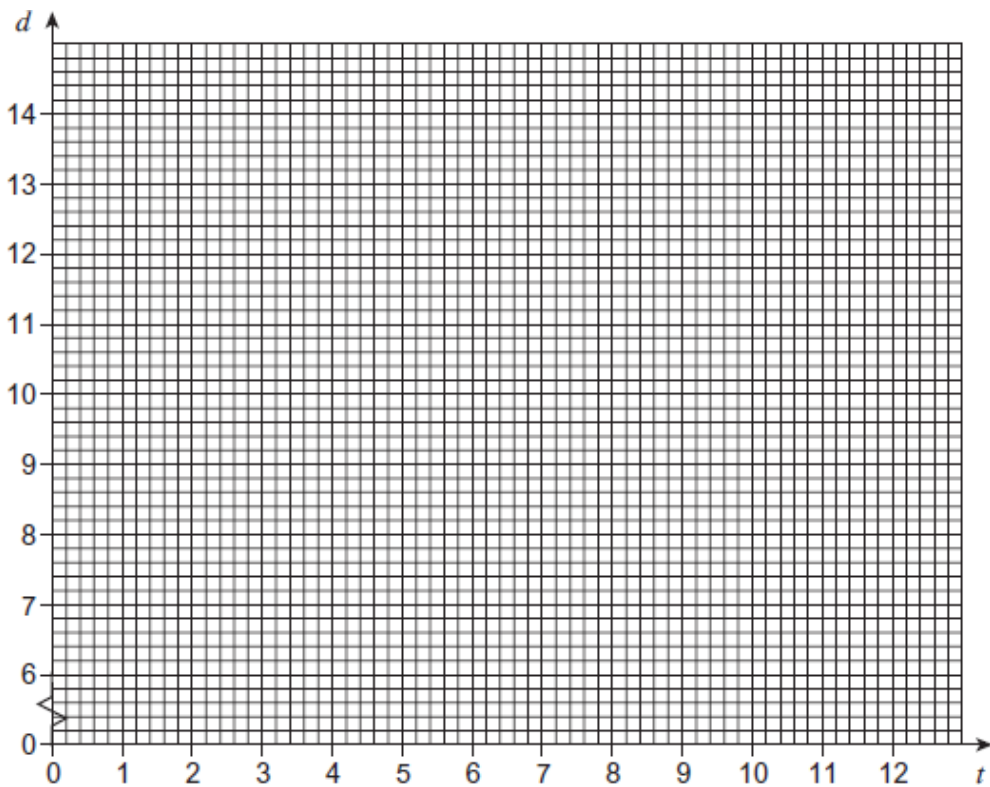
$$d = 10 - 4 \cos(30t)^\circ$$

(a) Complete the table of values.

t	0	1	2	3	4	5	6	7	8	9	10	11	12
d	6	6.5	8	10	12	13.5	14	13.5	12	10	8	6.5	

(1)

(b) On the grid, draw the graph of $d = 10 - 4 \cos(30t)^\circ$ for values of t from 0 to 12.



(2)

(c) The depth of water must be at least 9 metres for a ship to enter the harbour. At 12 noon a ship is waiting to enter the harbour.

Use the graph to estimate the **earliest** time the ship can enter.

Answer _____

(2)

- (d) A different ship enters the harbour at 4.15 pm.
The ship must leave the harbour before the depth of water falls below 9 metres.

Use the graph to estimate the maximum time the ship can stay in the harbour.
Give your answer in hours and minutes.

Answer _____ hours _____ minutes

(3)

(Total 8 marks)