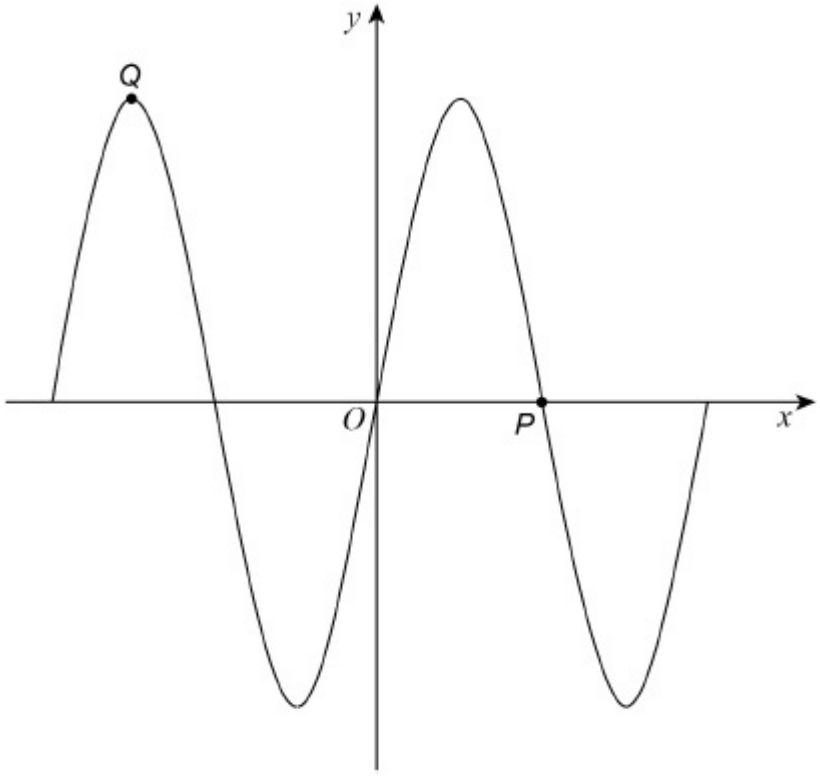
Non-Calculator

Q1.

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



(a) Write down the coordinates of P

Answer (_____, _____)

(1)

(b) Write down the coordinates of Q.

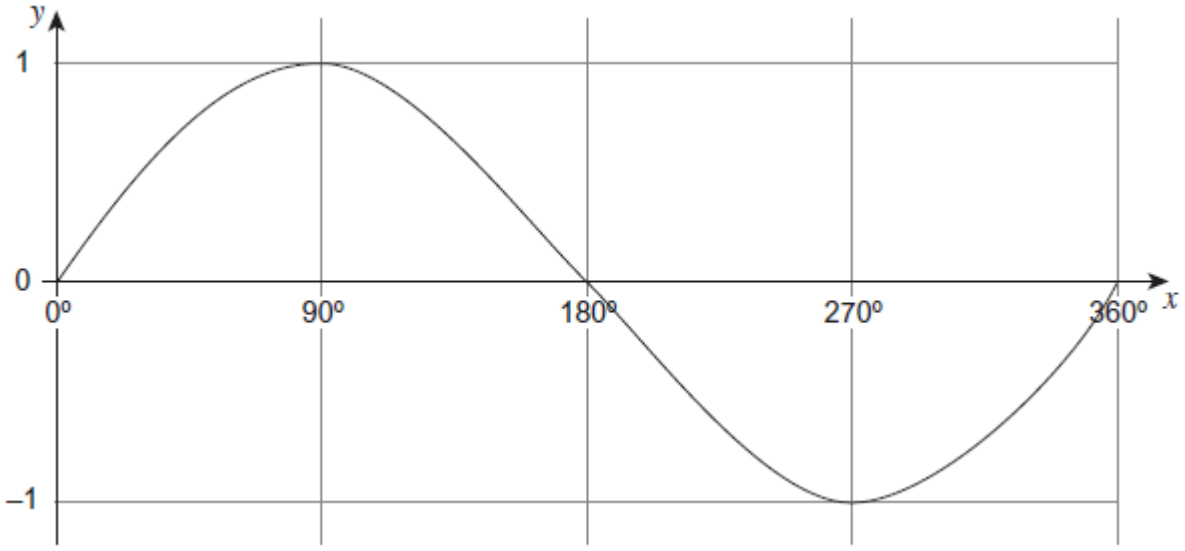
Answer (_____, _____)

(1)

(Total 2 marks)

Q2.

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



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

_____

Answer _____

(1)

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

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

_____

Answer _____

(1)

(Total 2 marks)

Q3.

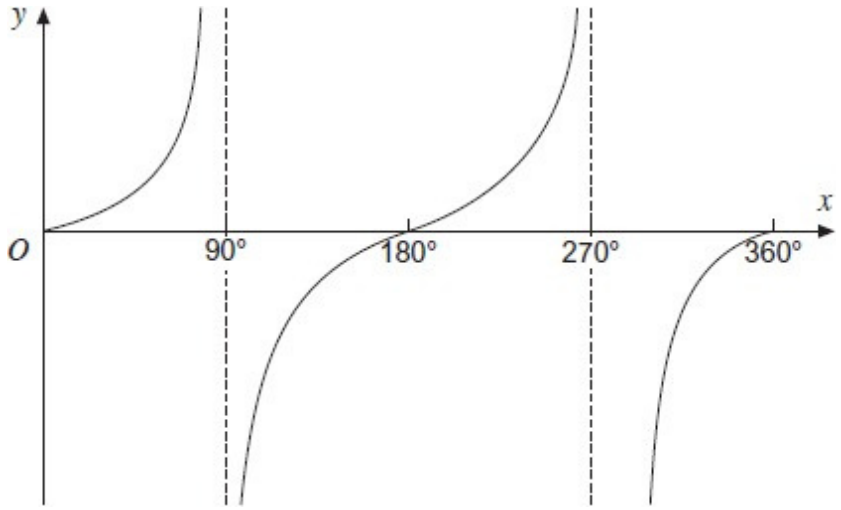
Which of these values cannot be the cosine of an angle?
Circle your answer.

−0.5 0 0.5 1.5

(Total 1 mark)

Q4.

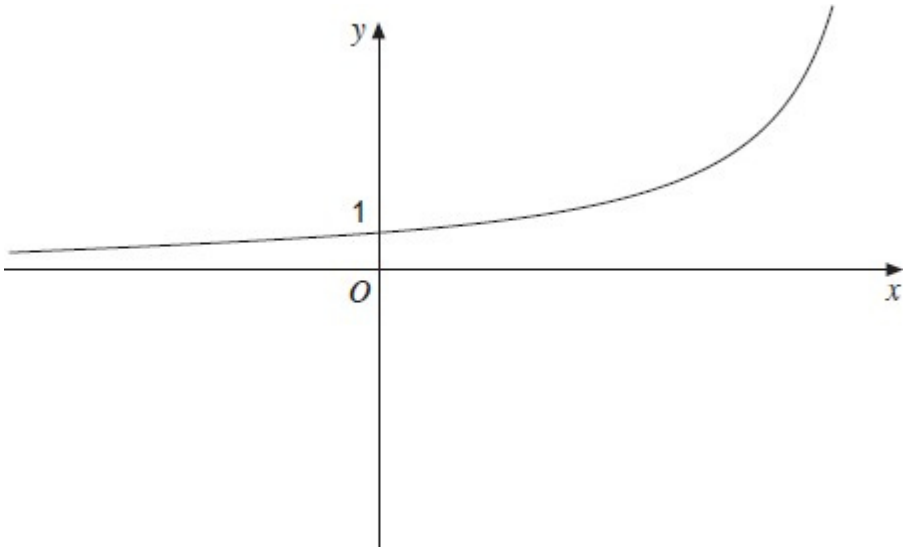
(a) Circle a possible equation for the graph shown below.



$y = \frac{1}{x}$ $y = \sin x$ $y = 2x$ $y = \tan x$

(1)

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



$y = \frac{1}{x}$ $y = \sin x$ $y = 2x$ $y = \tan x$

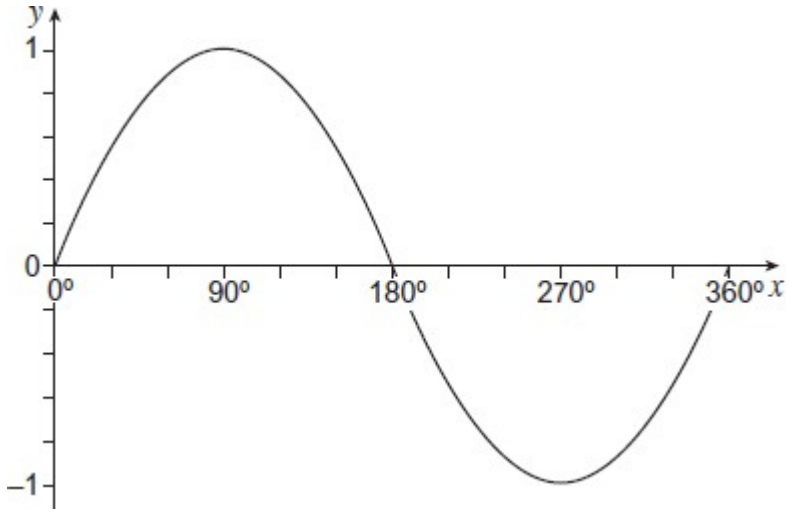
(1)

(Total 2 marks)

Calculator

Q5.

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



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

Work out the value of x.

_____

Answer _____

(1)

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

Work out one of the values of x.

_____

Answer _____

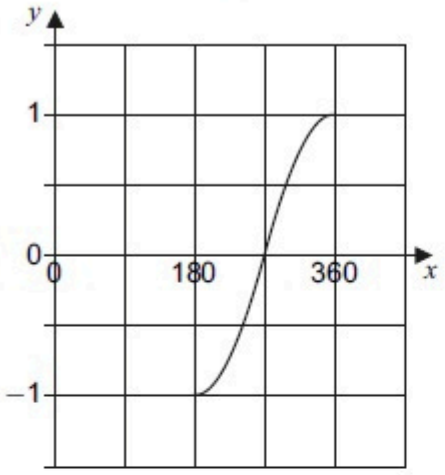
(1)

(Total 2 marks)

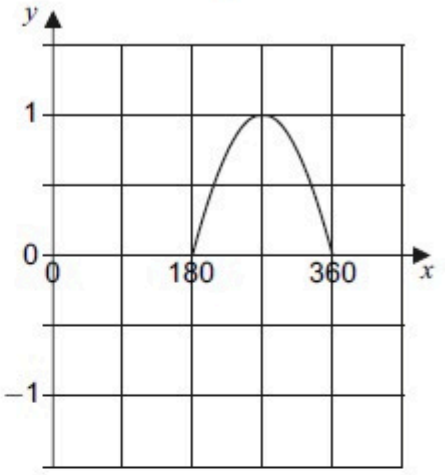
Q6.

Four graphs are shown for $-360° \leq x \leq 360°$

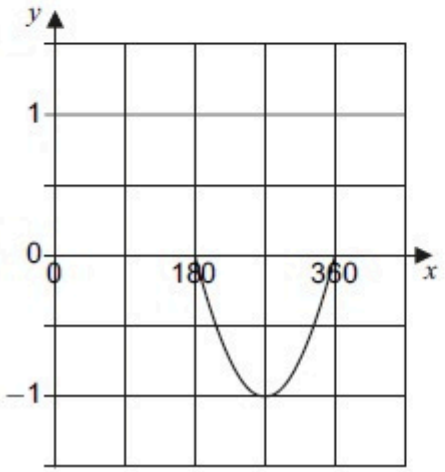
Graph A



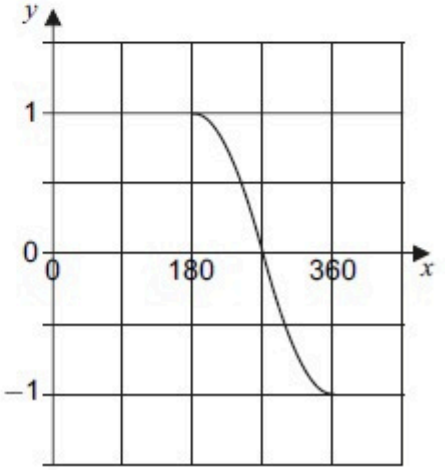
Graph B



Graph C



Graph D



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

Graph _____

(1)

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

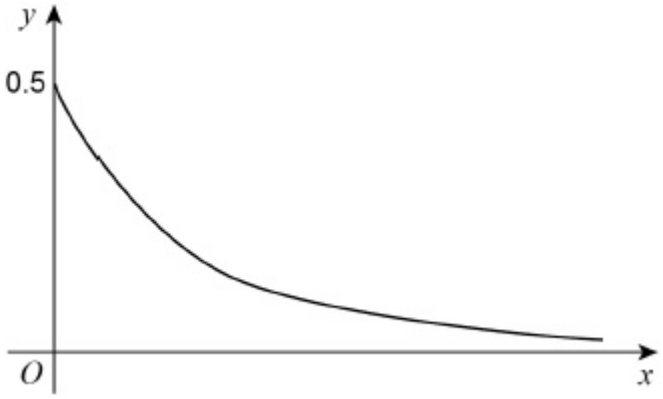
Graph _____

(1)

(Total 2 marks)

Q7.

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



Make one criticism of his sketch.

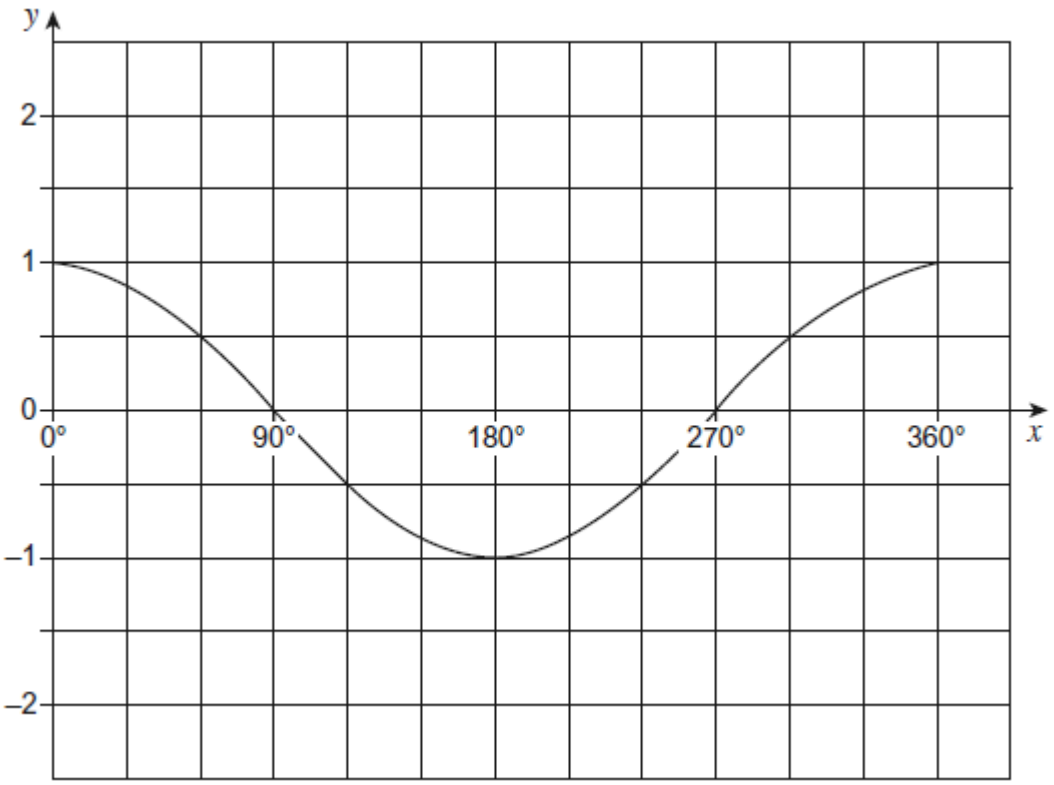
_____

_____

(Total 1 mark)

Q8.

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



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

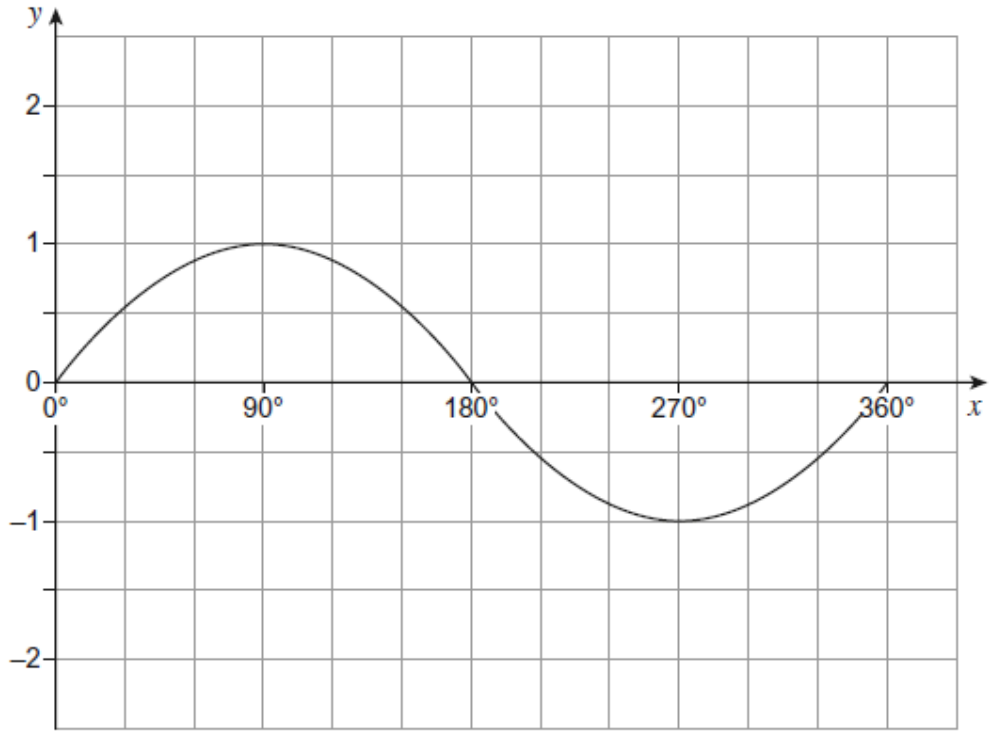
Answer _____ degrees

and _____ degrees

(Total 1 mark)

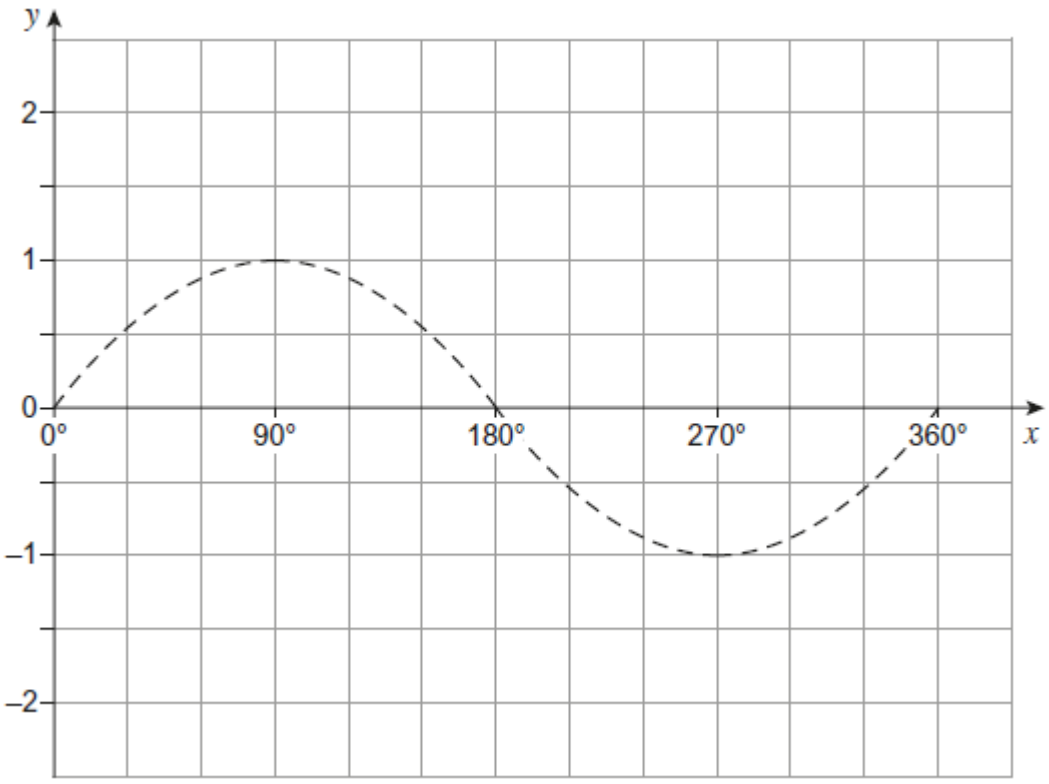
Q9.

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



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

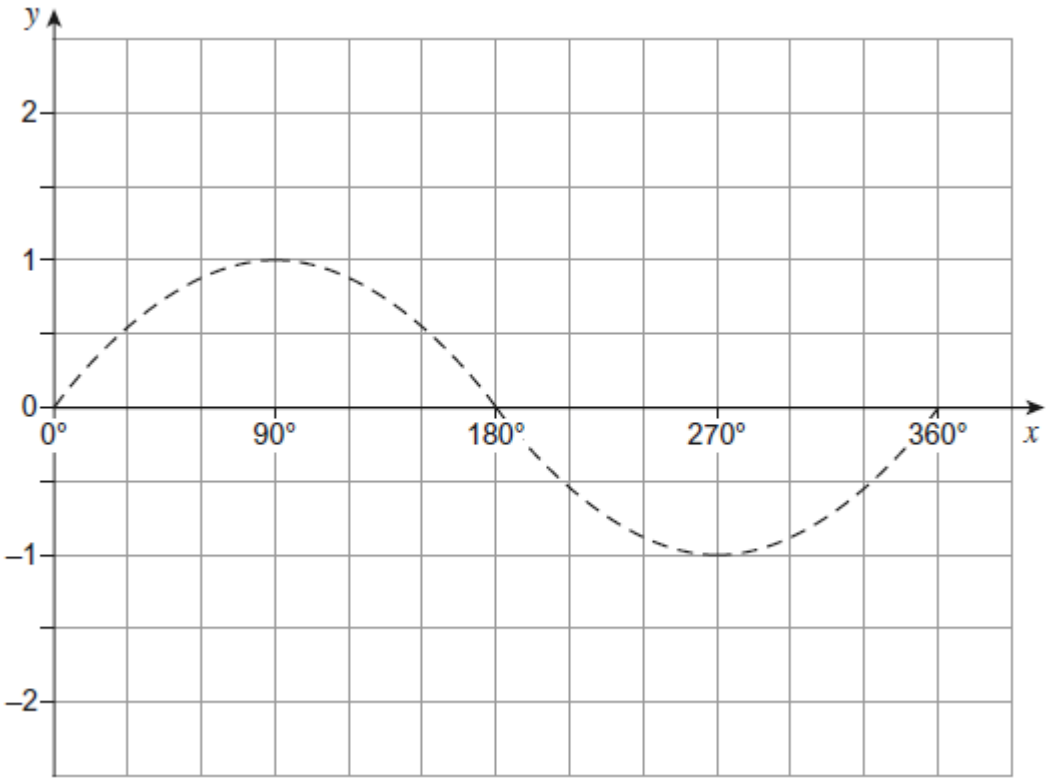
The graph of $y = \sin x$ is shown to help you.



(1)

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

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

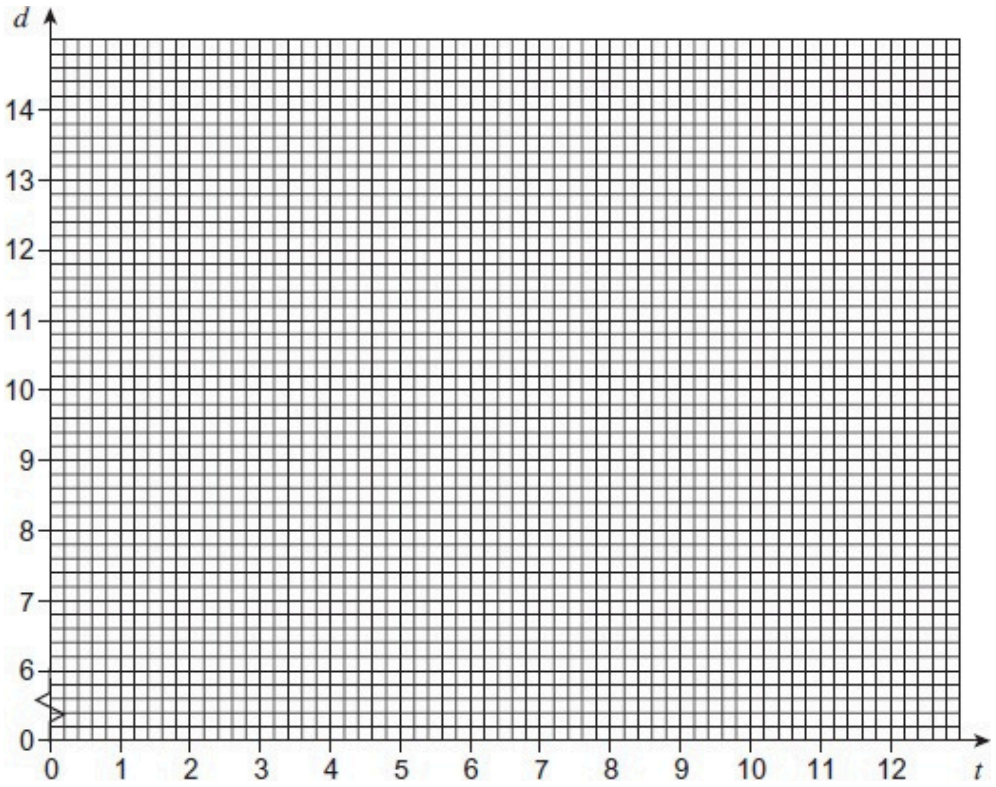
$$d = 10 - 4\cos(30t)°$$

(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 $d = 10 - 4\cos(30t)°$ 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)