

Trigonometric Graphs

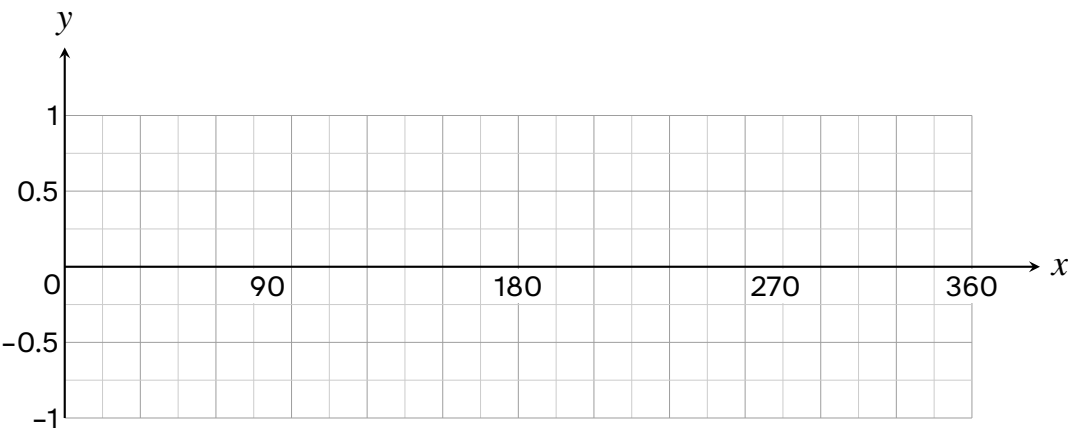
For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name _____

Total marks: **23**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

1 (a) On the grid, sketch the graph of $y = \cos x^\circ$ for $0 \leq x \leq 360$



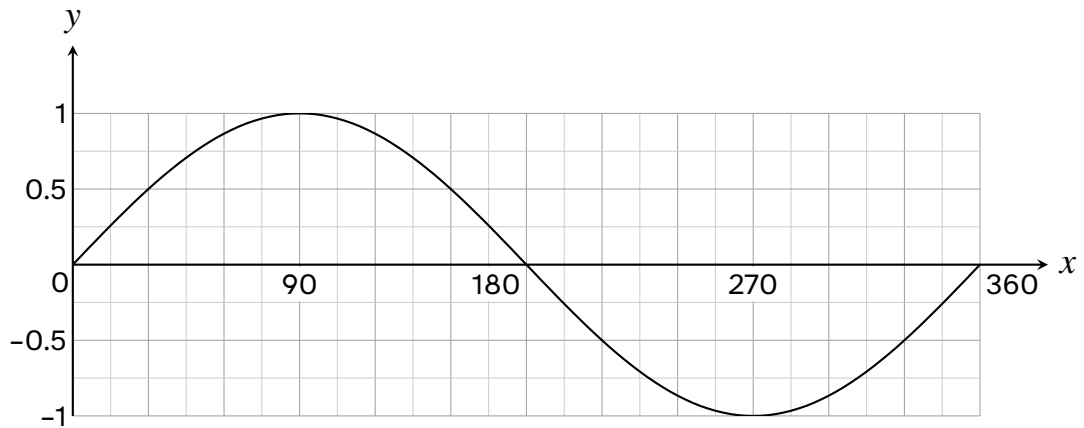
(2)

(b) Use your graph to find estimates of the solutions of $\cos x^\circ = 0.3$ for $0 \leq x \leq 360$

.....
(2)

(Total for Question 1 is 4 marks)

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



- (a) One solution of $\sin x^\circ = -0.4$ is $x = 203.6$ to 1 decimal place.
Find the other solution for $0 \leq x \leq 360$

.....
(2)

- (b) Solve the equation $2 \sin x^\circ = -\sqrt{2}$ for $0 \leq x \leq 360$

.....
(2)

- (c) Find all the solutions of $\sin x^\circ = -0.4$ for $360 \leq x \leq 720$
Give your answers correct to 1 decimal place.

.....
(2)

- (d) The graph of $y = \sin x^\circ$ is translated by the vector $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$

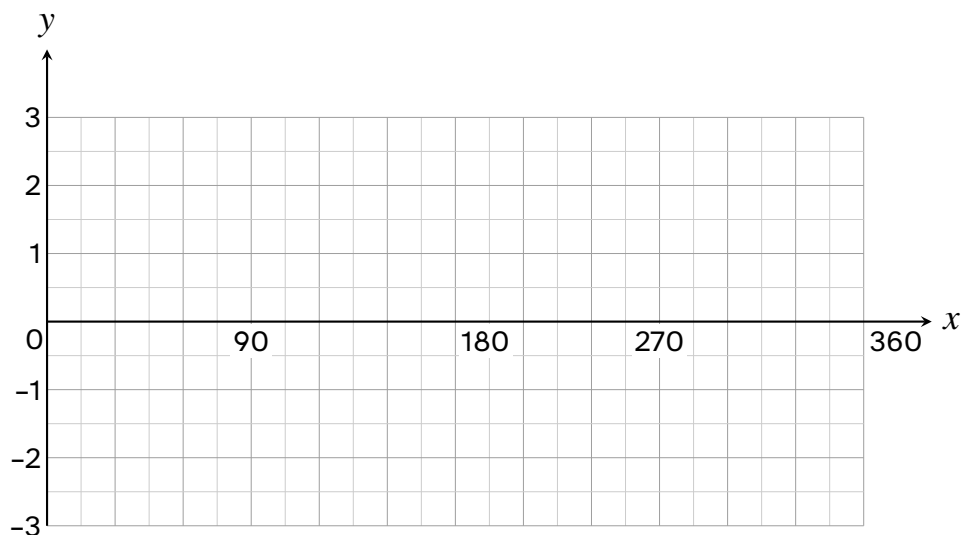
Write down the coordinates of the minimum point of the translated graph for $0 \leq x \leq 360$

(..... ,)

(1)

(Total for Question 2 is 7 marks)

- 3 (a) On the grid, sketch the graph of $y = \tan x^\circ$ for $0 \leq x \leq 360$



(2)

- (b) $\tan 60^\circ = \sqrt{3}$
Find another value of x , for $0 \leq x \leq 360$, for which $\tan x^\circ = \sqrt{3}$

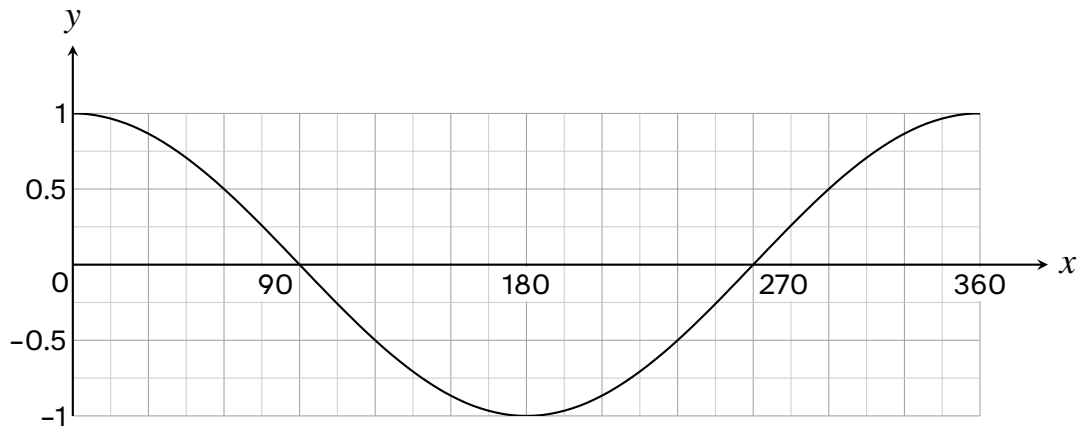
.....
(1)

- (c) Solve $\tan x^\circ = -1$ for $0 \leq x \leq 360$

.....
(2)

(Total for Question 3 is 5 marks)

- 4 Here is a graph of $y = \cos x^\circ$ for $0 \leq x \leq 360$



- (a) Write down the number of solutions of $\cos x^\circ = -0.9$ for $0 \leq x \leq 360$

.....
(1)

- (b) The equation $\cos x^\circ = k$ has exactly **one** solution for $0 \leq x \leq 360$
Write down the value of k .

$k =$
(1)

(Total for Question 4 is 2 marks)

- 5 The graph of $y = \sin x^\circ$ has a maximum point at $(90, 1)$
Write down the coordinates of the maximum point of $y = \sin x^\circ$ for $360 \leq x \leq 720$

(..... ,)
(1)

(Total for Question 5 is 1 mark)

- 6** The diagram shows a sketch of the curve with equation $y = a \sin x^\circ + b$ for $0 \leq x \leq 360$
The curve passes through the point $(0, 3)$ and has a maximum point at $(90, 7)$.

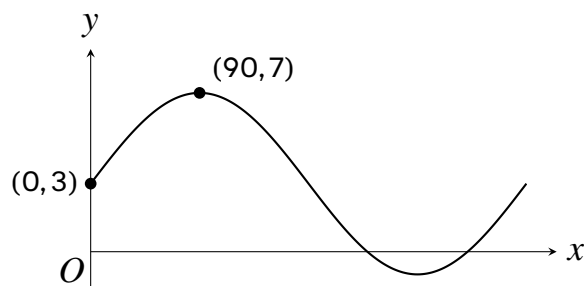


Diagram **NOT** accurately drawn

Find the exact value of y when $x = 240$

Give your answer in the form $p + q\sqrt{3}$ where p and q are integers.

.....
(4)

(Total for Question 6 is 4 marks)