PEARSON EDEXCEL INTERNATIONAL GCSE MATHEMATICS A (4MA1) · HIGHER TIER

Trigonometric Graphs: exam questions

10 questions · 24 marks · mark schemes at the end

Name _____ Date _____ Score / 24

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/trigonometric-graphs

1. **2 marks**

Solve $\sin x = 0.5$ for $0 \leqslant x \leqslant 360°$.

2. **2 marks**

Solve $\cos x = -0.5$ for $0 \leqslant x \leqslant 360°$.

3. **2 marks**

Solve $\tan x = 1$ for $0 \leqslant x \leqslant 360°$.

4. **2 marks**

For $0 \leqslant x \leqslant 360°$, write down the maximum value of $y = 3\sin x$ and the value of x at which it occurs.

5. **3 marks**

Solve $2\sin x + 1 = 0$ for $0 \leqslant x \leqslant 360°$.

6. **3 marks**

Solve $\sin x = 0.3$ for $0 \leqslant x \leqslant 360°$. Give your answers correct to 1 decimal place.

7. **2 marks**

$\sin 40° = 0.643$, correct to 3 decimal places.

(a) Write down another angle between $0°$ and $360°$ whose sine is 0.643 (to 3 d.p.). **(1)**

(b) Write down an angle between $0°$ and $360°$ whose sine is -0.643 (to 3 d.p.). **(1)**

8. 2 marks

(a) Write down the values of x between $0°$ and $360°$ where the graph of $y = \cos x$ crosses the x-axis. **(1)**

(b) Write down the range of values of $y = \cos x + 2$. **(1)**

9. 3 marks

Solve $4\cos x = 3$ for $0 \leqslant x \leqslant 360°$. Give your answers correct to 1 decimal place.

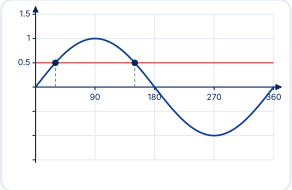
10. 3 marks

Solve $\tan x = -2$ for $0 \leqslant x \leqslant 360°$. Give your answers correct to 1 decimal place.

Answers and worked solutions

Question 1

2 marks



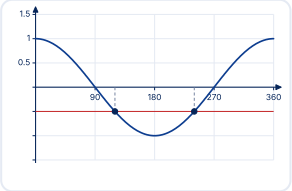
B1 $30°$

B1 $150°$

Answer: $30°$, $150°$

Question 2

2 marks



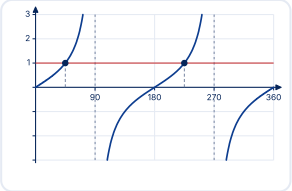
B1 $120°$

B1 $240°$

Answer: $120°$, $240°$

Question 3

2 marks



B1 $45°$

B1 $225°$

Answer: $45°$, $225°$

Question 4

2 marks

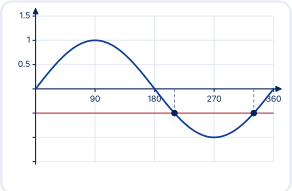
B1 maximum 3

B1 at $x = 90°$

Answer: maximum 3 at $x = 90°$

Question 5

3 marks



M1 $\sin x = -\frac{1}{2}$

A1 $210°$

A1 $330°$

Answer: $210°$, $330°$

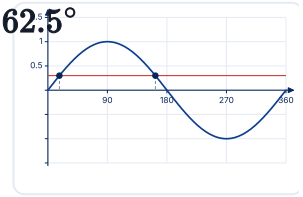
Question 6

3 marks

M1 $\sin^{-1} 0.3 = 17.45\ldots$

A1 $17.5°$

A1 $180 - 17.45\ldots = 162.5°$



Answer: $17.5°$, $162.5°$

Question 7

2 marks

(a)

B1 $140°$

(b)

B1 $220°$ or $320°$

Answer: (a) $140°$; (b) $220°$ or $320°$

Question 8

2 marks

(a)

B1 $90°$ and $270°$

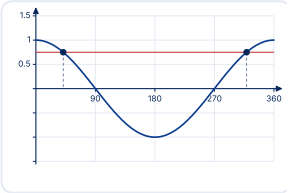
(b)

B1 $1 \leqslant y \leqslant 3$

Answer: (a) $90°$, $270°$; (b) $1 \leqslant y \leqslant 3$

Question 9

3 marks



M1 $\cos x = 0.75$

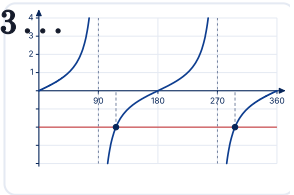
A1 $41.4°$

A1 $318.6°$

Answer: $41.4°$, $318.6°$

Question 10

3 marks



M1 $\tan^{-1}(-2) = -63.43\ldots$

A1 $116.6°$

A1 $296.6°$

Answer: $116.6°$, $296.6°$

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/trigonometric-graphs
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