Angles in All Four Quadrants and Exact Values

Specification: AQA 7357: E1, E3 · Edexcel 9MA0: 5.1, 5.3

HOMEWORK Consolidation

1 State the quadrant of each angle θ and the signs of $\sin\theta$, $\cos\theta$ and $\tan\theta$.

(a) $170°$

(b) $-100°$

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2 Write each one as a trigonometric ratio of an acute angle.

(a) $\cos 250°$

(b) $\sin 345°$

(c) $\tan(-110°)$

AQA E1/E3 · Edexcel 5.1/5.3 · L1

3 No calculator. Find the exact values of

(a) $\sin 240°$

(b) $\cos 135°$

(c) $\tan 330°$

(d) $\cos(-300°)$

AQA E1/E3 · Edexcel 5.1/5.3 · L1

4 No calculator. Write down the values of

(a) $\sin 630°$

(b) $\cos 270°$

(c) $\tan 720°$

AQA E1/E3 · Edexcel 5.1/5.3 · L1

5 (a) Write down the four angles between 0° and 360° whose related acute angle is 25°.

(b) Which two of them have $\sin\theta = -\sin 25°$?

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6 No calculator. In triangle ABC, $AB = 3$ cm, $AC = 5$ cm and angle $BAC = 120°$. Find the exact length of BC.

AQA E1 · Edexcel 5.1 · Ch9 L1

7 No calculator. A triangle has sides 6 cm and 10 cm with an angle of 135° between them. Find its exact area.

AQA E1 · Edexcel 5.1 · Ch9 L4

8 Use the graph of $y = \sin\theta$ to find all the values of θ in the interval $0° \le \theta \le 720°$ for which $\sin\theta = \sin 70°$.

AQA E3 · Edexcel 5.3 · Ch9 L6

9 (a) Describe the transformation that maps $y = \cos x$ onto $y = \cos(x - 30°)$.

(b) Find the exact coordinates of the point where $y = \cos(x - 30°)$ meets the y-axis.

AQA E3 · Edexcel 5.3 · Ch9 L7

10 No calculator. In triangle ABC, $BC = 6$ cm, angle $BAC = 30°$ and angle $ABC = 45°$. Find the exact length of AC.

AQA E1 · Edexcel 5.1 · Ch9 L2

11 *AQA-style*. No calculator. In triangle ABC, $AB = 3$ cm, $BC = 7$ cm and angle $ABC = 120°$.

(a) Write down the exact value of $\cos 120°$. [1 mark]

(b) Show that $AC = \sqrt{79}$ cm. [3 marks]

(c) Find the exact area of triangle ABC. [2 marks]

AQA E1/E3 · Edexcel 5.1/5.3, AQA E1 · Edexcel 5.1 · L1, Ch9 L1, L4 · AQA-style

12 *Edexcel-style*. $P(-½, -\frac{\sqrt{3}}{2})$ is on the unit circle; OP is at angle θ to the positive x-axis, $0° \le \theta < 360°$.

(a) Explain why θ is in quadrant 3; find θ. [2 marks]

(b) Find $\sin\theta$ and $\tan\theta$ exactly. [2 marks]

(c) Q is P reflected in the y-axis, at angle φ. Find φ and $\tan\varphi$ exactly. [2 marks]

AQA E1/E3 · Edexcel 5.1/5.3, AQA E1 · Edexcel 5.1 · L1, Ch9 L6 · Edexcel-style