Unit Review

Specification: AQA 7357: E1, E3, B9 · Edexcel 9MA0: 5.1, 5.3, 2.9

INDEPENDENT

Mixed practice

A · Fluency

1 In triangle PQR, PQ = 8.2 cm, PR = 11.5 cm and angle QPR = 67°. Find QR.

2 In triangle ABC, angle BAC = 38°, angle ABC = 105° and BC = 14 cm. Find AC.

3 A triangle has sides 13 cm and 9 cm with an angle of 128° between them. Find its area.

4 No calculator. Given that $\sin 60° = \frac{\sqrt{3}}{2}$ and $\cos 60° = \frac{1}{2}$, use the graphs of $y = \sin x$, $y = \cos x$ and $y = \tan x$ to find the exact value of
(a) $\sin 120°$
(b) $\cos 240°$
(c) $\tan(-60°)$

5 Describe the single transformation that maps
(a) $y = \sin x$ onto $y = 3\sin x$
(b) $y = \cos x$ onto $y = \cos 4x$
(c) $y = \tan x$ onto $y = \tan(x - 45°)$
and write down the period of each new graph.

6 A triangle has sides 6.5 cm, 9 cm and 13.5 cm. Find the size of its largest angle.

B · Multi-step triangles

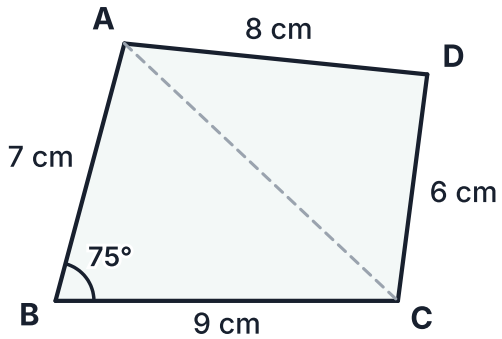
7 In triangle ABC, AB = 9 cm, AC = 7 cm and angle ABC = 45°. Find the two possible lengths of BC.

8 A ship sails 18 km from P to Q on a bearing of 065°, then 11 km from Q to R on a bearing of 160°. Find
(a) the distance PR
(b) the bearing of R from P.

9 From a point A, the angle of elevation of the top T of a tower is 24°. From a point B, 50 m nearer the foot of the tower on the same level ground, the angle of elevation is 41°. Find the height of the tower.

10 In triangle ABC, AB = 7 cm, AC = 11 cm and the area is 30 cm². Angle BAC is obtuse. Find BC.

11 The diagram shows a quadrilateral $ABCD$ with AB = 7 cm, BC = 9 cm, CD = 6 cm, DA = 8 cm and angle ABC = 75°. Find
(a) the length of the diagonal AC
(b) angle ADC
(c) the area of $ABCD$.



C · Graphs and transformations

No calculator for this section.

12 Sketch the graph of $y = \sin(x - 60°)$ for $0° \le x \le 360°$. Show the coordinates of the points where the graph meets the axes and of its maximum and minimum points.

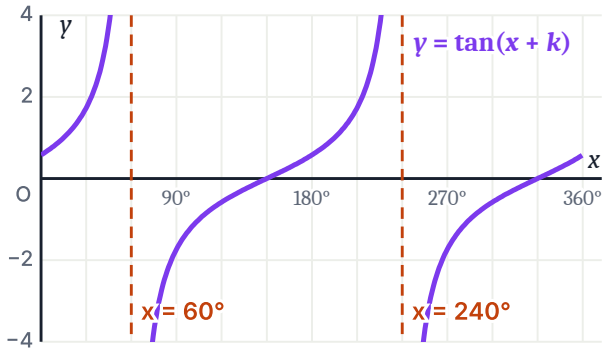
13 Sketch the graph of $y = \cos \frac{1}{2}x$ for $0° \le x \le 720°$. Show the coordinates of the points where the graph meets the axes and of its maximum and minimum points.

14 Use the graph of $y = \cos\theta$ to find all the values of θ in the interval $-180° \le \theta \le 360°$ for which $\cos\theta = -\cos 25°$.

15 The graph shows $y = \tan(x + k)$, $0° \le x \le 360°$, where k is a constant with $0 < k < 90°$. Its asymptotes are $x = 60°$ and $x = 240°$.

(a) Find k.

(b) Find the exact coordinates of the point where the graph meets the y-axis.



D · Reasoning, exact values and "show that"

No calculator for this section.

16 A triangle has sides 7 cm, 8 cm and 13 cm.

(a) Show that its largest angle is 120°.

(b) Find the exact area of the triangle.

17 In triangle ABC, AB = 10 cm and angle ABC = 30°. The side AC has length b cm. Find the values of b for which there are

(a) two possible triangles

(b) exactly one triangle

(c) no triangle.

18 (a) Describe the single transformation that maps the graph of $y = \sin x$ onto the graph of $y = \sin(x + 180°)$.

(b) Use graphs to show that $\sin(x + 180°) = -\sin x$.

(c) Hence find the exact value of $\sin 240°$.

E · Exam-style questions

Use the mark scheme to self-assess. Each question uses more than one part of the unit.

19 *AQA-style*. In triangle ABC, AB = 6 cm, AC = 9 cm and the area of the triangle is 18 cm².

(a) Show that $\sin BAC = \frac{2}{3}$. [2 marks]

(b) Explain, using the graph of $y = \sin x$, why angle BAC has two possible values. [1 mark]

(c) Given that angle BAC is obtuse, find the length of BC. [4 marks]

20 *Edexcel-style*. (a) Sketch the graph of $y = \tan(x - 45°)$ for $0° \le x \le 360°$. Show the asymptotes and the coordinates of the points where the graph meets the axes. [3 marks]

(b) Given that $\tan 30° = \frac{1}{\sqrt{3}}$, use your graph to solve $\tan(x - 45°) = \frac{1}{\sqrt{3}}$ for $0° \le x \le 360°$. [3 marks]