
GCSE Mathematics

The Cosine Rule

Mark Scheme - Higher Tier | Grades 6-8

M = method mark, A = accuracy mark (dependent on the preceding M mark), B = independent mark.

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Edexcel-style questions

Q1 Grade 6 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$a^2 = 8^2 + 10^2 - 2 \times 8 \times 10 \times \cos 60^\circ$	M1
(a)	$a^2 = 84$	M1
(a)	$a = 9.17 \text{ cm (3 s.f.)}$	A1

Q2 Grade 7 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{8^2 + 9^2 - 7^2}{2 \times 8 \times 9}$	M1
(a)	$\cos A = 0.6667$	M1
(a)	$A = 48.2^\circ \text{ (1 d.p.)}$	A1

Q3 Grade 7 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$AC^2 = 15^2 + 20^2 - 2 \times 15 \times 20 \times \cos 110^\circ$	M1
(a)	$AC^2 = 830.2$	M1
(a)	$AC = 28.8 \text{ km (3 s.f.)}$	A1

Q4 Grade 8 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{8^2 + 9^2 - 15^2}{2 \times 8 \times 9}$	M1
(a)	$\cos A = -0.5556$	M1
(a)	$A = 123.7^\circ \text{ (1 d.p.)}$	A1

Q5 Grade 8 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	largest angle is B, opposite the longest side CA (11 cm)	M1
(a)	$\cos B = \frac{6^2 + 8^2 - 11^2}{2 \times 6 \times 8}$	M1
(a)	$B = 102.6^\circ \text{ (1 d.p.)}$	A1

AQA-style questions

Q6 Grade 6 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$a^2 = 7^2 + 9^2 - 2 \times 7 \times 9 \times \cos 50^\circ$	M1
(a)	$a^2 = 49.01$	M1
(a)	$a = 7.00 \text{ cm (3 s.f.)}$	A1

Q7 Grade 7 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{10^2 + 11^2 - 6^2}{2 \times 10 \times 11}$	M1
(a)	$\cos A = 0.8409$	M1
(a)	$A = 32.8^\circ \text{ (1 d.p.)}$	A1

Q8 Grade 7 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$AC^2 = 12^2 + 18^2 - 2 \times 12 \times 18 \times \cos 95^\circ$	M1
(a)	$AC^2 = 505.7$	M1
(a)	$AC = 22.5 \text{ km (3 s.f.)}$	A1

Q9 Grade 8 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{6^2 + 8^2 - 13^2}{2 \times 6 \times 8}$	M1
(a)	$\cos A = -0.7188$	M1
(a)	$A = 136.0^\circ \text{ (1 d.p.)}$	A1

Q10 Grade 8 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	largest angle is B, opposite the longest side CA (13 cm)	M1
(a)	$\cos B = \frac{7^2 + 9^2 - 13^2}{2 \times 7 \times 9}$	M1
(a)	$B = 108.0^\circ \text{ (1 d.p.)}$	A1

OCR-style questions

Q11 Grade 6 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$a^2 = 6^2 + 11^2 - 2 \times 6 \times 11 \times \cos 75^\circ$	M1
(a)	$a^2 = 122.8$	M1
(a)	$a = 11.1 \text{ cm (3 s.f.)}$	A1

Q12 Grade 7 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{9^2 + 13^2 - 8^2}{2 \times 9 \times 13}$	M1
(a)	$\cos A = 0.7949$	M1
(a)	$A = 37.4^\circ \text{ (1 d.p.)}$	A1

Q13 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$AC^2 = 25^2 + 17^2 - 2 \times 25 \times 17 \times \cos 105^\circ$	M1
(a)	$AC^2 = 1134$	M1
(a)	$AC = 33.7 \text{ km (3 s.f.)}$	A1

Q14 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{9^2 + 10^2 - 17^2}{2 \times 9 \times 10}$	M1
(a)	$\cos A = -0.6$	M1
(a)	$A = 126.9^\circ \text{ (1 d.p.)}$	A1

Q15 Grade 8 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	largest angle is B, opposite the longest side CA (14 cm)	M1
(a)	$\cos B = \frac{5^2 + 12^2 - 14^2}{2 \times 5 \times 12}$	M1
(a)	$B = 103.0^\circ \text{ (1 d.p.)}$	A1

Teachably-style questions

Q16 Grade 6 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$a^2 = 9^2 + 12^2 - 2 \times 9 \times 12 \times \cos 45^\circ$	M1
(a)	$a^2 = 72.26$	M1
(a)	$a = 8.50 \text{ cm (3 s.f.)}$	A1

Q17 Grade 7 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{11^2 + 14^2 - 10^2}{2 \times 11 \times 14}$	M1
(a)	$\cos A = 0.7045$	M1
(a)	$A = 45.2^\circ \text{ (1 d.p.)}$	A1

Q18 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$AC^2 = 14^2 + 22^2 - 2 \times 14 \times 22 \times \cos 100^\circ$	M1
(a)	$AC^2 = 787.0$	M1
(a)	$AC = 28.1 \text{ km (3 s.f.)}$	A1

Q19 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	$\cos A = \frac{5^2 + 7^2 - 11^2}{2 \times 5 \times 7}$	M1
(a)	$\cos A = -0.6714$	M1
(a)	$A = 132.2^\circ \text{ (1 d.p.)}$	A1

Q20 Grade 8 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	largest angle is B, opposite the longest side CA (15 cm)	M1
(a)	$\cos B = \frac{8^2 + 10^2 - 15^2}{2 \times 8 \times 10}$	M1
(a)	$B = 112.4^\circ \text{ (1 d.p.)}$	A1

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