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

Right-Angled Trigonometry: exam questions

10 questions · 26 marks · mark schemes at the end

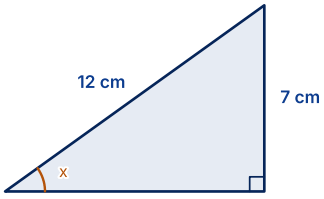
Name _____ Date _____ Score / 26

- 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/right-angled-trigonometry

1. **2 marks**

In a right-angled triangle, the side opposite angle x is 7 cm and the hypotenuse is 12 cm.

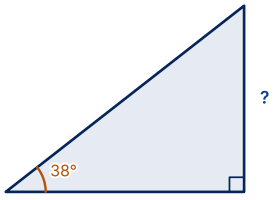
Work out the size of angle x.



2. **2 marks**

In a right-angled triangle, one angle is $38°$ and the side next to it (not the hypotenuse) is 15 cm.

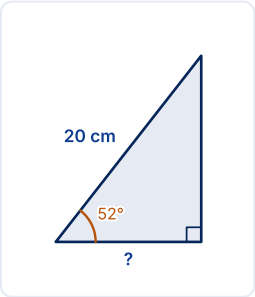
Work out the length of the side opposite the $38°$ angle.



3. **2 marks**

In a right-angled triangle the hypotenuse is 20 cm and one angle is $52°$.

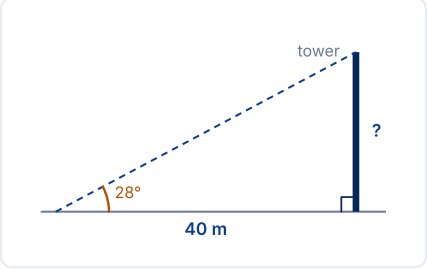
Work out the length of the side next to the $52°$ angle.



4. **2 marks**

From a point on level ground 40 m from the foot of a tower, the angle of elevation of the top of the tower is $28°$.

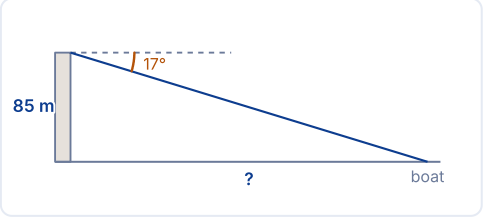
Work out the height of the tower.



5. **3 marks**

A cliff is 85 m high. From the top of the cliff, the angle of depression of a boat is $17°$.

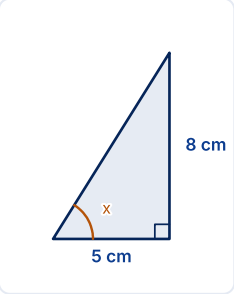
Work out the horizontal distance of the boat from the foot of the cliff.



6. **2 marks**

In a right-angled triangle the two shorter sides are 8 cm and 5 cm. The angle x is opposite the 8 cm side.

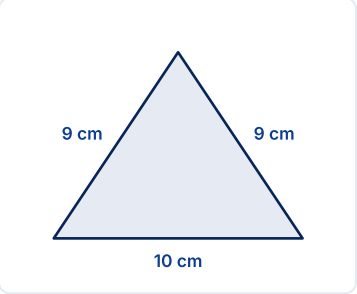
Work out the size of angle x.



7. **3 marks**

An isosceles triangle has sides 9 cm, 9 cm and 10 cm.

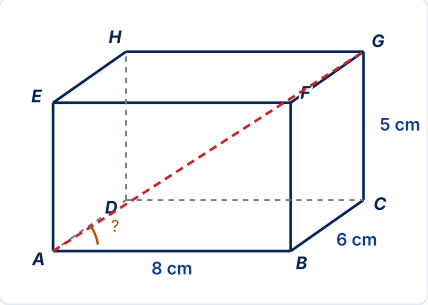
Work out the size of one of its base angles.



8. **4 marks**

A cuboid has a base 8 cm by 6 cm and a height of 5 cm.

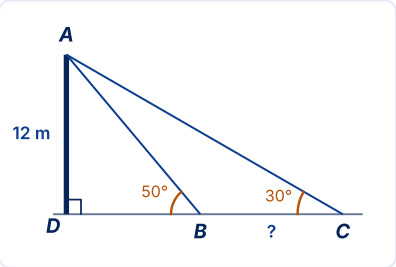
Work out the angle between a diagonal of the cuboid and its base.



9. **4 marks**

A vertical pole AD is 12 m tall, with D on level ground. Points B and C are on the ground, in a straight line with D and on the same side of it. The angle of elevation of A from B is $50°$ and from C is $30°$.

Work out the distance BC.



10. **2 marks**

A ramp rises 1.2 m over a horizontal distance of 9 m.

Work out the angle the ramp makes with the horizontal.



Answers and worked solutions

Question 1 — 2 marks

M1 $\sin x = \dfrac{7}{12}$

A1 $35.7°$

Answer: $35.7°$

Question 2 — 2 marks

M1 $15 \tan 38°$

A1 11.7 cm

Answer: 11.7 cm

Question 3 — 2 marks

M1 $20 \cos 52°$

A1 12.3 cm

Answer: 12.3 cm

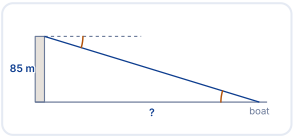
Question 4 — 2 marks

M1 $40 \tan 28°$

A1 21.3 m

Answer: 21.3 m

Question 5 — 3 marks



M1 angle of elevation from the boat is $17°$

M1 $\dfrac{85}{\tan 17°}$

A1 278 m

Answer: 278 m

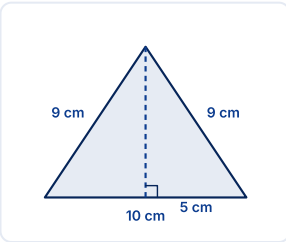
Question 6 — 2 marks

M1 $\tan x = \dfrac{8}{5}$

A1 $58.0°$

Answer: $58.0°$

Question 7 — 3 marks



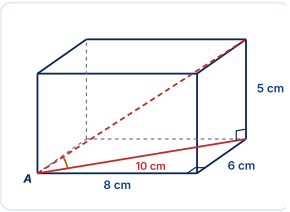
M1 split into two right-angled triangles with base 5 cm

M1 $\cos x = \dfrac{5}{9}$

A1 $56.3°$

Answer: $56.3°$

Question 8 — 4 marks



M1 diagonal of the base $\sqrt{8^2 + 6^2} = 10$

M1 the right-angled triangle with sides 10 cm and 5 cm

M1 $\tan x = \dfrac{5}{10}$

A1 $26.6°$

Answer: $26.6°$

Question 9 — 4 marks

M1 $DB = \dfrac{12}{\tan 50°} = 10.06\ldots$

M1 $DC = \dfrac{12}{\tan 30°} = 20.78\ldots$

M1 $20.78\ldots - 10.06\ldots$

A1 10.7 m

Answer: 10.7 m

Question 10 — 2 marks

M1 $\tan x = \dfrac{1.2}{9}$

A1 $7.6°$

Answer: $7.6°$

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/right-angled-trigonometry
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