Right-Angled Trigonometry questions and answers

10 questions · 8 Core, 2 Extended · 2 non-calculator · worked answers

Name _____ Date _____ Score _____

- Original questions in the style of the Cambridge 0580 papers, each labelled Core or Extended and calculator or non-calculator. Try every question before you look at the answers.
- Worked answers start after the questions. Questions with marks come from our 0580 practice bank (M method, A accuracy, B independent marks).
- Online, with more practice: igcsemathrevision.com/igcse-frontend/0580/right-angled-trigonometry-questions

Core: for everyone (Papers 1 and 3, and Extended Papers 2 and 4)

1. **Core · calculator · easy**

In a right-angled triangle the hypotenuse is 10 cm and one angle is 32°.
Find the side opposite the 32° angle, correct to 3 significant figures.

2. **Core · calculator · easy**

In a right-angled triangle one angle is 50° and the side adjacent to it is 7 cm.
Find the side opposite the 50° angle, correct to 3 significant figures.

3. **Core · non-calculator · easy · 2 marks**

Which ratio, sin, cos or tan, would you use to find a side in a right-angled triangle when you know

(a) an angle and the hypotenuse, and you want the side opposite the angle

(b) an angle and the side next to it (not the hypotenuse), and you want the side opposite?

4. **Core · calculator · easy · 2 marks**

In a right-angled triangle, one angle is $35°$ and the hypotenuse is 12 cm. Find the side opposite the $35°$ angle. Give your answer correct to 3 significant figures.

5. **Core · calculator · medium**

In a right-angled triangle the hypotenuse is 9 cm and the side opposite angle x is 5 cm.
Find x, correct to 1 decimal place.

6. **Core · calculator · medium**

In a right-angled triangle one angle is 40° and the side adjacent to it is 12 cm.
Find the hypotenuse, correct to 3 significant figures.

7. **Core · non-calculator · medium · 3 marks**

A straight ramp rises 5 m over a horizontal distance of 12 m.

(a) Find the length of the ramp.

(b) Write down the tangent of the angle the ramp makes with the horizontal, as a fraction.

8. **Core · calculator · hard**

A ship sails 8 km due north and then 6 km due east.

(a) How far is it from its starting point?

(b) Find the bearing of the ship from its starting point, correct to 1 decimal place.

Extended: for Papers 2 and 4

9. **Extended · calculator · medium**

From a point on level ground 25 m from the foot of a tower, the angle of elevation of the top of the tower is 38°.

Find the height of the tower, correct to 3 significant figures.

10. **Extended · calculator · hard**

From the top of a cliff 80 m high, the angle of depression of a boat is 14°.

How far is the boat from the foot of the cliff? Give your answer correct to 3 significant figures.

Answers and worked solutions

Question 1

Answer: 5.30 cm

1. $\sin 32^\circ = \frac{\text{opp}}{10}$
2. opp $= 10 \sin 32^\circ = 5.299\ldots$ cm

Question 2

Answer: 8.34 cm

1. $\tan 50^\circ = \frac{\text{opp}}{7}$
2. opp $= 7 \tan 50^\circ = 8.342\ldots$ cm

Question 3 — 2 marks

Answer: (a) $\sin$ (b) tan

B1 (a) sine

B1 (b) tangent

Question 4 — 2 marks

Answer: 6.88 cm

M1 $12 \times \sin 35°$

A1 6.88 cm (6.882…)

Question 5

Answer: 33.7°

1. $\sin x = \frac{5}{9}$
2. $x = \sin^{-1}\left(\frac{5}{9}\right) = 33.74\ldots^\circ$

Question 6

Answer: 15.7 cm

1. $\cos 40^\circ = \frac{12}{h}$
2. $h = \frac{12}{\cos 40^\circ} = 15.66\ldots$ cm

Question 7 — 3 marks

Answer: (a) $13\ m$ (b) $\frac{5}{12}$

M1 (a) $\sqrt{5^2 + 12^2}$

A1 (a) 13 m

B1 (b) $\frac{5}{12}$

Question 8

Answer: (a) 10 km (b) 036.9°

1. (a) $\sqrt{8^2 + 6^2} = 10$ km
2. (b) The angle east of north: $\tan\theta = \frac{6}{8}$, $\theta = 36.86\ldots^\circ$. Bearings use three figures.

Question 9

Answer: $19.5\ m$

1. $\tan 38^\circ = \frac{h}{25}$
2. $h = 25 \tan 38^\circ = 19.53\ldots m$

Question 10

Answer: $321\ m$

1. The angle of depression equals the angle of elevation from the boat (alternate angles): 14°.
2. $\tan 14^\circ = \frac{80}{d}$, so $d = \frac{80}{\tan 14^\circ} = 320.8\ldots m$

More right-angled trigonometry practice with instant marking, notes and common mistakes: igcsemathrevision.com/igcse-frontend/0580/right-angled-trigonometry-questions

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