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Trigonometry

Student Worksheet

Questions & Working Space

IGCSE Mathematics

Name: _____

Date: _____

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Note

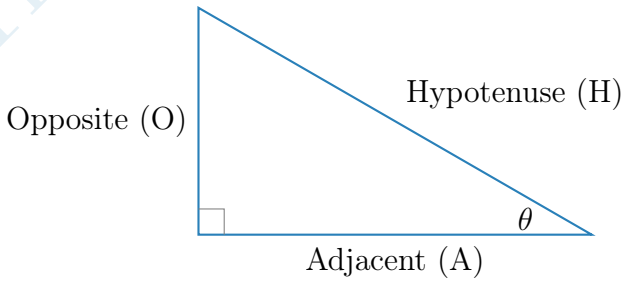
How to use this worksheet. These questions are built *strictly* on the *Trigonometry* notes: labelling sides as Opposite, Adjacent and Hypotenuse; the three ratios SOH CAH TOA; finding missing sides; finding missing angles with inverse functions; exact trigonometric values; angles of elevation and depression; bearings; trigonometry in 2D shapes; trigonometry in 3D; and choosing between Pythagoras and trigonometry.
Calculator. Make sure your calculator is in **degree mode** before you start — an answer that is wildly too small is usually a sign it is in radians. Keep full accuracy in your working and round only at the final step.
Working space. Ruled lines follow each question — show *all* of your working there. Label O, A and H on your sketch, name the ratio you are using, and include units. Where a question says **exact**, put the calculator away and leave a surd. Harder questions have a teal **Hint** box; try the question first.
Checking your answers. Full step-by-step solutions, a marking scheme for the exam paper, and a quick answer key are in the separate booklet *"Trigonometry — Solutions & Answer Key."* Try each question honestly before you look.

1 Part I — Topic-by-Topic Exercises

1.1 Labelling Sides and Choosing a Ratio

Note

Reminder: the Hypotenuse is always opposite the right angle. The Opposite and Adjacent swap over depending on which angle you are working from.



Exercise L1 *[Basic]*

In triangle ABC the right angle is at B. Taking θ to be the angle at A, state which side is the Opposite, which is the Adjacent and which is the Hypotenuse.

Exercise L2 *[Basic]*

Using the same triangle as in Exercise L1, now take θ to be the angle at C. State which side is the Opposite, which is the Adjacent and which is the Hypotenuse, and say which of the three labels has **not** changed.

Exercise L3 *[Standard]*

In triangle PQR the right angle is at Q, with $PQ = 9\,\text{cm}$, $QR = 12\,\text{cm}$ and $PR = 15\,\text{cm}$. Relative to angle P, write down the length of the Opposite, the Adjacent and the Hypotenuse.

Exercise L4 *[Intermediate]*

State which ratio (sine, cosine or tangent) you would use in each case, and whether you would need an inverse function:

(a) You know the angle and the Hypotenuse, and want the Opposite.

(b) You know the angle and the Adjacent, and want the Opposite.

(c) You know the Opposite and the Adjacent, and want the angle.

(d) You know the angle and the Adjacent, and want the Hypotenuse.

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1.2 Finding Missing Sides

Note

If the unknown is on the *top* of the fraction, multiply. If it is on the *bottom*, divide.

Exercise S1 *[Basic]*

A right-angled triangle has a hypotenuse of 11 cm and an angle of 34°. Find the length of the side opposite that angle, correct to 3 significant figures.

Exercise S2 *[Basic]*

A right-angled triangle has a hypotenuse of 14.5 cm and an angle of 27°. Find the length of the side adjacent to that angle, correct to 3 significant figures.

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Exercise S3 *[Standard]*

In a right-angled triangle, the side adjacent to an angle of 62° measures 6.8 cm. Find the length of the opposite side, correct to 3 significant figures.

Exercise S4 *[Standard]*

In a right-angled triangle, the side opposite an angle of 39° measures 9.6 cm. Find the length of the hypotenuse, correct to 3 significant figures.

Hint

The unknown ends up on the bottom of the fraction here, so the final step is a division rather than a multiplication.

Exercise S5 *[Standard]*

In a right-angled triangle, the side adjacent to an angle of 71° measures 5.4 cm. Find the length of the hypotenuse, correct to 3 significant figures.

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