

The Panda Math Tutor

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Trigonometry

Student Worksheet
Questions & Working Space
IGCSE Mathematics

Name: _____

Date: _____

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Teach → Practice → Reason → Apply → Challenge → Master

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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.

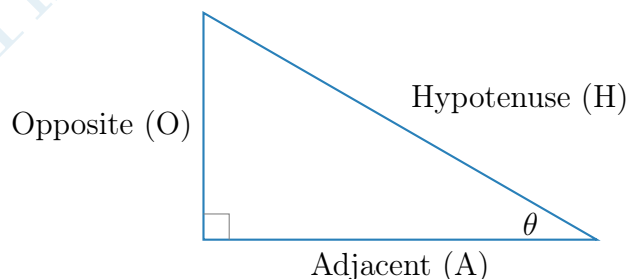
Checking your answers. Full step-by-step solutions, a marking scheme for the exam paper, and a quick answer key are in the separate booklet “*Trigonometry — Solutions & Answer Key.*” Try each question honestly before you look.

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 $PQ = 9$ cm, $QR = 12$ cm and $PR = 15$ 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.
-

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.

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.

Preview ends here

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