Trigonometry Basics

Year 11 General Maths Units 1 and 2



Learning Objectives

By the end of the lesson I hope that you understand and can apply the following to a range of questions from the Unit I and 2 General Mathematics course.

- Understand how to label the sides of a right angled triangle
- Know that we can use SOHCAHTOA to help us find trigonometric ratios.
- Know the difference between a ratio and an angle
- Know how to use the CAS to find Trig Ratios



Recap of past learning

This isn't the first time you will have met Trigonometry and it's not going to be the last!

I love this topic as you can pretty much smash it using the word SOHCAHTOA.

Or, as my Maths teacher at school used to make us recite:





This is a Herring – it's a type of fish!



This is a Trawler – it's a fishing boat!



Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook

I'm sure he hate us

I really don't understand why he made us learn the following:

Silly Old Harry Caught A Herring Trawling Off America



I really think he hated us ... sigh ... but on with the Maths!



Labelling a right-angled triangle

The first really important thing to note it ... THIS ONLY WORKS WITH RIGHT-ANGLED TRIANGLES.

The longest side of a right-angled triangle is called the Hypotenuse.

I used to think people were just struggling to say Hippopotamus.

The rest of the sides can only be labelled with reference to an known (or unknown by given) angle.

The diagram uses 'x' to be the angle.







When the angle is in the other corner, then the adjacent and opposite sides will naturally switch.





Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook

What is a **ratio**?

A ratio is a **fraction**.

When you write something as a ratio you leave it as a fraction!

Trigonometric ratios are always written as fractions.





Using SOHCAHTOA





Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook WWW

Finding a ratio using SOHCAHTOA

Let's find some Trig Ratios using SOHCAHTOA.

Find $\sin \theta$, $\cos \theta$ and $\tan \theta$ for the following triangle:

S^OHC^AHT^OA



Ing raho $5in\theta = 0 = 4$ H = 5 $COSO = A = \frac{3}{5}$ $H = \frac{5}{5}$ $fcm\theta = \frac{\theta}{A} = \frac{4}{3}$



Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook

. . -

Example 1

Give the lengths of the hypotenuse, the opposite side and the adjacent side in the triangle shown.





Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook WWW

Example 2

Refer to the diagram to answer the questions below.

- **a** What is the name of the side that is 12 units long?
- **b** Name the side that is 5 units long.
- **c** Give the name of the side that is 13 units long.



a) Opposite b) Adjacent c) Hypotenuse



Make sure the CAS is always in the right mode!

You can use the instructions here to change the mode of your CAS.







Example 3

Use your graphics calculator to find, to four decimal places, the value of: **a** $\sin 49^{\circ}$ **b** $\cos 16^{\circ}$ **c** $\tan 27.3^{\circ}$



Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook WW

Finding the value of trig ratios

We can use the CAS to find values of trig ratios which have been provided to us in the question

Example: Use your graphics calculator to find, correct to four decimal places, the value of:

- sin 49°
- cos 16°
- tan 27.3°





Examples have been extracted, with permission, from the Cambridge General Mathematics Units 1 and 2 Textbook

Learning Objectives: Revisited

By the end of the lesson I hope that you understand and can apply the following to a range of questions from the Unit 1 and 2 General Mathematics course.

- Understand how to label the sides of a right angled triangle
 Know that we can use SOHCAHTOA to help us find trigonometric ratios.
- Know the difference between a ratio and an angle
- Know how to use the CAS to find Trig Ratios

