

Trigonometric Ratios

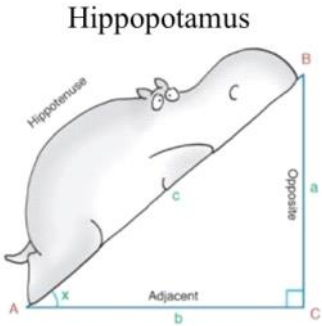
Wednesday, 14 February 2018 7:53 pm

Lesson, Starter, examples, exercise	Methods
Pre-test	2
4.1 Trigonometric ratios	4-5(s), 6
Let's start: Which ratio?	10, 13
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Key questions

- Which is the longest side of a right angled triangle?
- What is a trigonometric ratio?
- What is SOHCAHTOA and how do I use it?

The longest side, the Adjacent and the Opposite



Strange as it seems, I always remember the longest side as I remember seeing this image and just seeing a Hippo everywhere.

The Opposite and Adjacent sides are labeled with reference to the angle.

Let's call the angle the "reference angle".

The trigonometric ratios

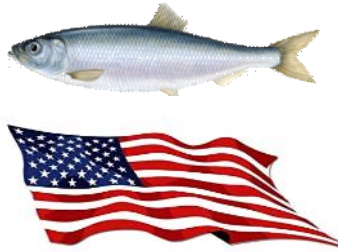
There are three formulae which help us relate the size of an angle in relation to the ratio of sides.

What is a ratio????

Most people think it's the thing with the dots!
Actually a ratio can also be a **fraction**!

1:5

SOHCAHTOA: Silly Old Harry Caught A Herring Trawling Off America?!



Try again ...

Silly	→	SOH
Old		=
Harry		CAH
Caught		=
A		TOA
Herring		=
Trawling		
Off		
America		

This is a way to help us remember the three trigonometric identities ...

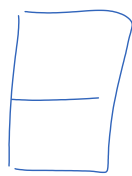
$$\sin \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

Examples:

Using a calculator find $\cos 37^\circ$



$$\cos 37 = 0. \dots$$

2 decimal places

Solve the following for x and write the answer correct to two decimal places:

$$\cos 23^\circ = \frac{x}{3}$$

$$3 \cos 23^\circ = x$$

$$x = \dots \text{ (2 dp)}$$

$$\frac{\sin 30^\circ}{1} = \frac{5}{x}$$

$$\frac{a}{b} = \frac{c}{d} \Rightarrow a \cdot d = b \cdot c$$

$$\sin 30^\circ = \frac{5}{x}$$

$$x = \frac{5}{\sin 30^\circ}$$

Find the value of the pronumerals in the right angled triangles shown below:



$$\cos \theta = \frac{\text{Adj}}{\text{Hyp}}$$

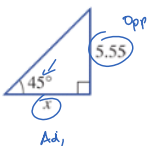
$$\cos 65^\circ = \frac{x}{12}$$

$$12 \cos 65 = x$$

$$x = \cos 65 \times 12$$

$$2 \times 3$$

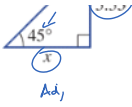
$$3 \times 2$$



T.A

$$\tan \theta = \frac{\text{Opp}}{\text{Adj}}$$

$$\tan 45^\circ = \frac{5.55}{x}$$



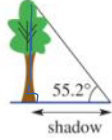
$$\tan 45^\circ = \frac{\text{Opp}}{\text{Adj}} = \frac{5.55}{x}$$

$$x = \frac{5.55}{\tan 45^\circ}$$

Worded question:

The angle from the horizontal of the line of sight from the end of a tree's shadow to the top of the tree is 55.2° . The

length of the shadow is 15.5 m. Find the height of the tree, correct to one decimal place.



← Always look for a right angled triangle then you can use trig to find missing side lengths or angles.

