

What's Going On?

Checking In

Minds on

White Boards!

Action!

sin, cos or tan?

Consolidation

Playing with calculators

Learning Goal - I will be comfortable with the three trig ratios (sin, cos and tan)

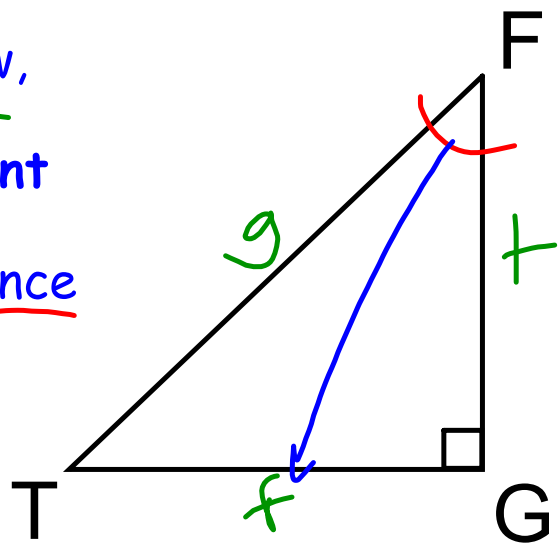
Checking In

F.F.M.

Name: _____

Date: _____

Given the right triangle below,
identify the **opposite**, **adjacent**
and **hypotenuse** if our reference
angle is F.

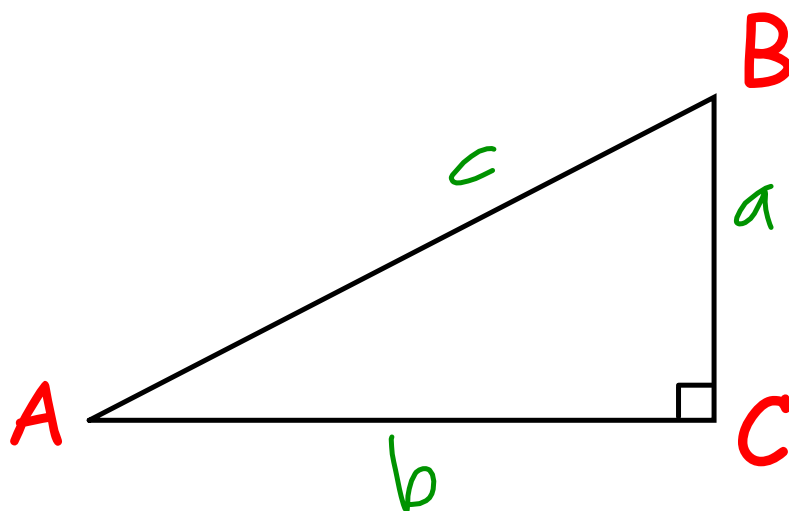


Minds on

Labelling a Triangle

When we deal with triangles, we need to be able to properly label all of the sides and all of the angles.

Angles are labelled with capital letters, sides are labelled with lower case letters. We always label sides based on their OPPOSITE angles.

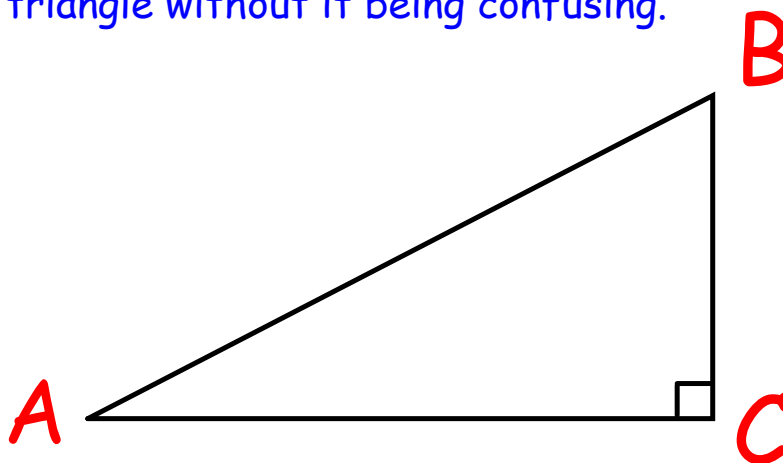


Minds on

Reference Angles

When we are exploring right triangles, we typically have what is called a reference angle.

We use a reference angle so that we can easily talk about different sides of the triangle without it being confusing.



Minds on

Reference Angles

Once we have chosen our reference angle we can refer to the three sides of a right triangle as the:

opposite side

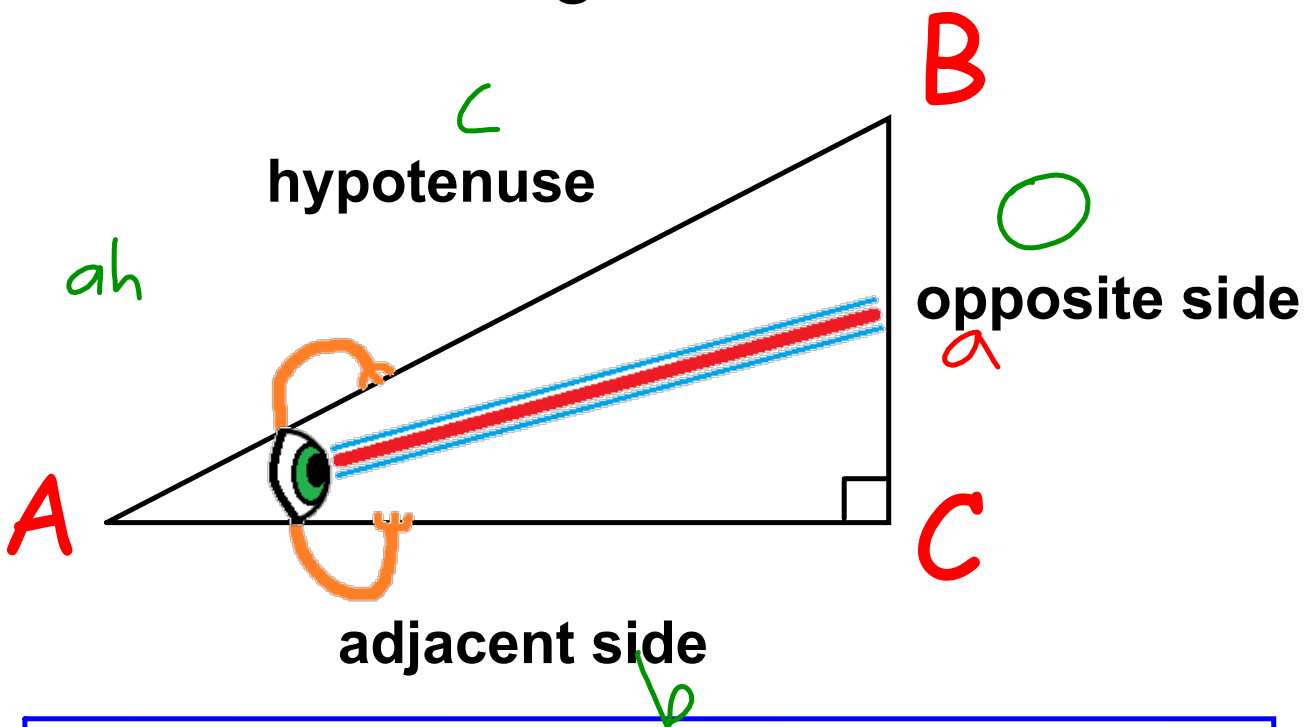
adjacent side

hypotenuse

**NEW
TERMS!**

Minds on

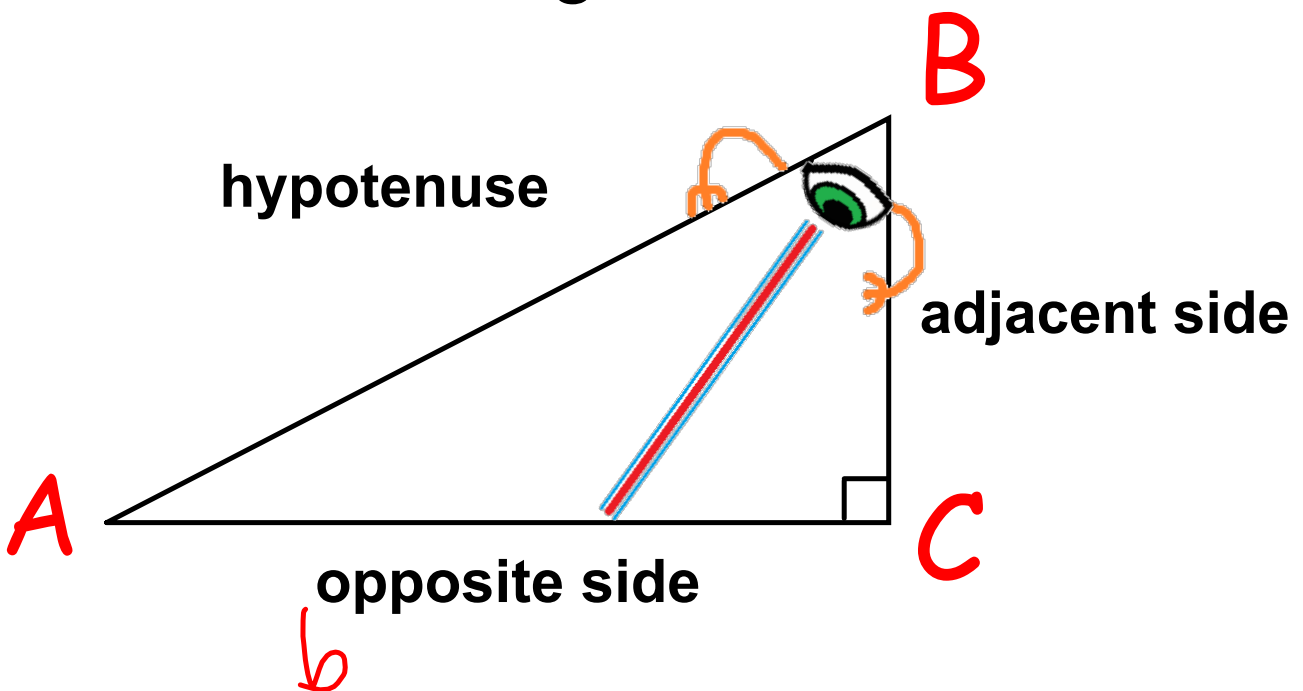
The Angle Monster



The angle monster always looks at his opposite side and hugs his adjacent side and his hypotenuse.

Minds on

The Angle Monster



The angle monster always looks at his opposite side and hugs his adjacent side and his hypotenuse.

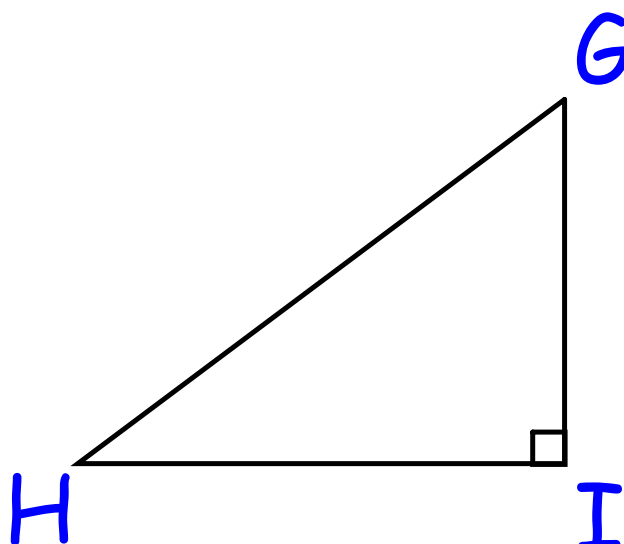
Minds on

Reference Angles

opposite: _____

adjacent: _____

hypotenuse: _____



Without a reference angle, we can't do this!!

Minds on

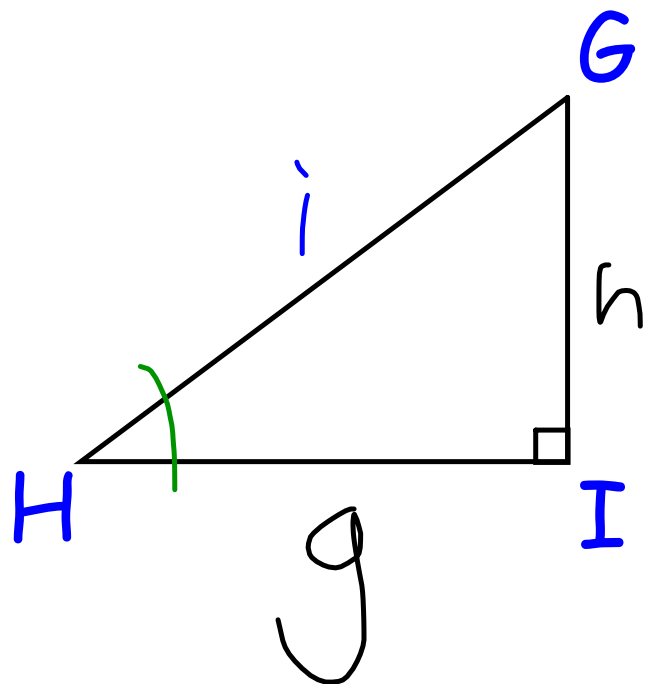
Reference Angles

Reference Angle: H

opposite: h

adjacent: g

hypotenuse: i



Minds on

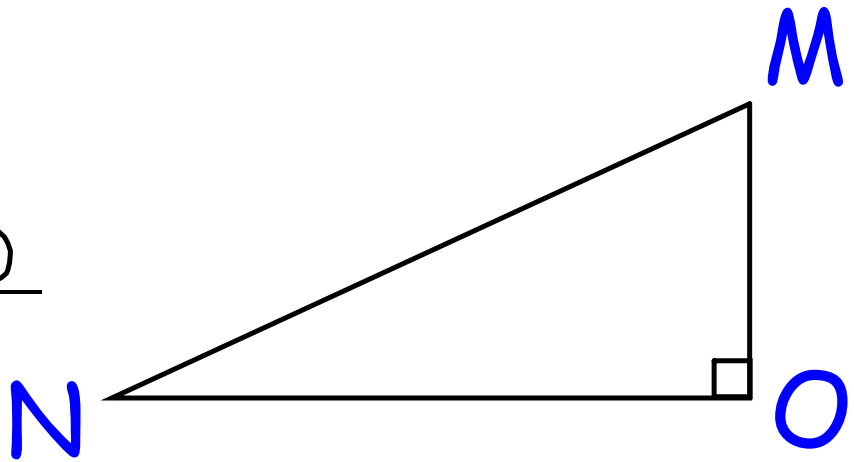
Reference Angles

Reference Angle: M

opposite: h

adjacent: a

hypotenuse: o



Minds on

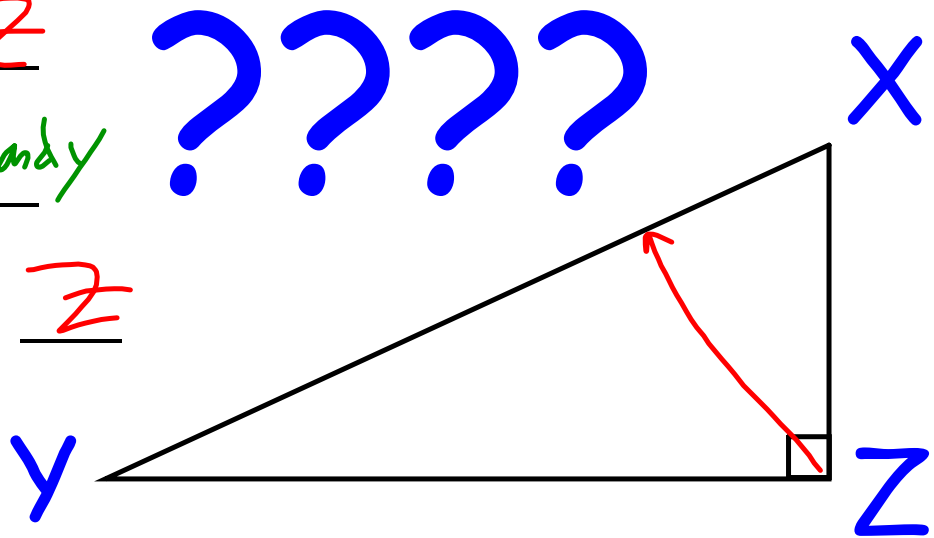
Reference Angles

Reference Angle: z

opposite: z

adjacent: x and y

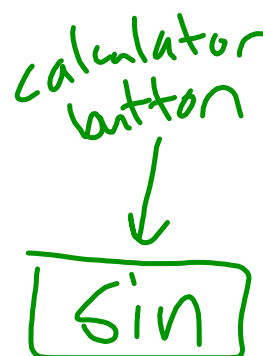
hypotenuse: z



**NEVER USE THE RIGHT
ANGLE (90°) AS A
REFERENCE ANGLE!!!!**

Action!

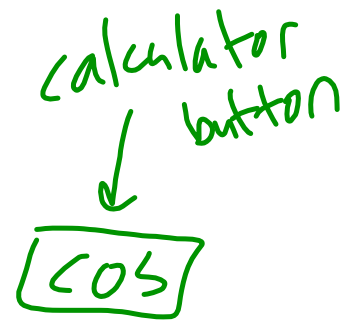
$$\text{sine (angle)} = \frac{\text{opposite}}{\text{hypotenuse}}$$



The "**sine**" of an angle tells you the ratio of the side **OPPOSITE** the angle to the **HYPOTENUSE**.

Action!

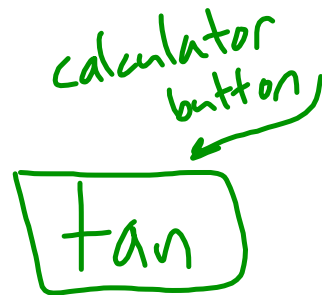
$$\text{cosine (angle)} = \frac{\text{adjacent}}{\text{hypotenuse}}$$



The "cosine" of an angle tells you the ratio of the side ADJACENT to the angle to the HYPOTENUSE.

Action!

$$\text{tangent (angle)} = \frac{\text{opposite}}{\text{adjacent}}$$



The "**t**angent" of an angle tells you the ratio of the side OPPOSITE the angle to the side ADJACENT to the angle.

Action!

The Primary Trigonometric Ratios

$$\sin(\text{angle}) = \frac{\text{opposite}}{\text{hypotenuse}}$$

soh

$$\cos(\text{angle}) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

cah

$$\tan(\text{angle}) = \frac{\text{opposite}}{\text{adjacent}}$$

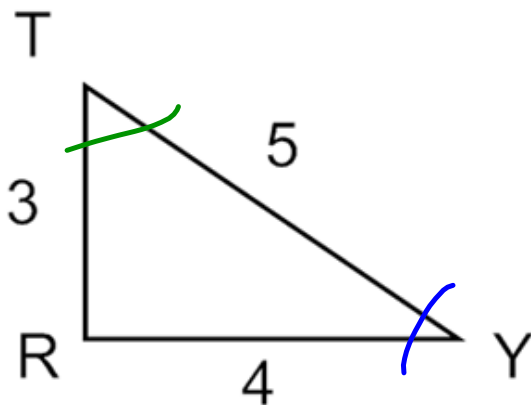
toa

It's amazing!

YES!!!!

sohcahtoa

LOVE IT!
YOU



If we use T as the reference angle:

The opposite side is: 4

The adjacent side is: 3

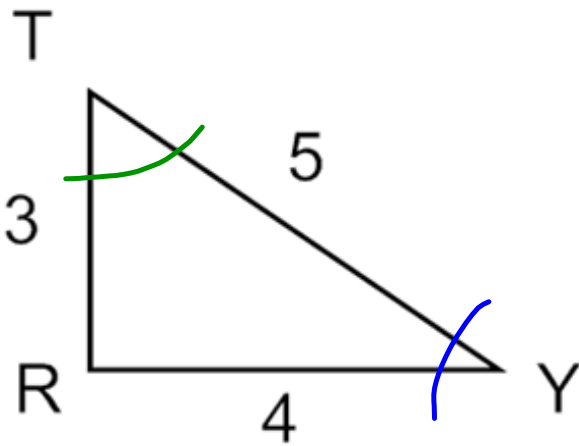
The hypotenuse is: 5

If we use Y as the reference angle:

The opposite side is: 3

The adjacent side is: 4

The hypotenuse is: 5



$\sin(T) = \frac{4}{5}$	$\cos(T) = \frac{3}{5}$	$\tan(T) = \frac{4}{3}$	↖ flip it
$\sin(Y) = \frac{3}{5}$	$\cos(Y) = \frac{4}{5}$	$\tan(Y) = \frac{3}{4}$	

Take it to the GSP!

Take it to the GSP!

Remember...

sin(angle) is just some number!

$$\sin(2^\circ) = 0.0349$$

$$\sin(6^\circ) = 0.1045$$

$$\sin(25^\circ) = 0.4226$$

$$\sin(45^\circ) = 0.7071$$

$$\sin(76^\circ) = 0.9741$$

$$\sin(89^\circ) = 0.9998$$

sin(any angle) is always less than 1

Take it to the GSP!

Remember...

sin(angle) is just some number!

...so is **cos(angle)**

$$\cos(1^\circ) = 0.9998$$

$$\cos(12^\circ) = 0.9781$$

$$\cos(28^\circ) = 0.8429$$

$$\cos(45^\circ) = 0.7071$$

$$\cos(67^\circ) = 0.3907$$

$$\cos(89^\circ) = 0.0174$$



cos (any angle) is always less than 1

Take it to the GSP!

Remember...

sin(angle) is just some number!

...so is **cos(angle)** and **tan (angle)**

$$\tan(1^\circ) = 0.0175$$

$$\tan(10^\circ) = 0.1763$$

$$\tan(45^\circ) = 1$$

$$\tan(66^\circ) = 2.2460$$

$$\tan(86^\circ) = 24.6362$$

$$\tan(89.99^\circ) = 5729.5779$$