

What's Going On?

Checking In

Minds on

Reference Angles

Action!

The Trigonometric Ratios

Consolidation

Setting up to solve.

Learning Goal - I will understand when to use each trigonometric ratio to solve a right-triangle problem.

New Unit

Trigonometry

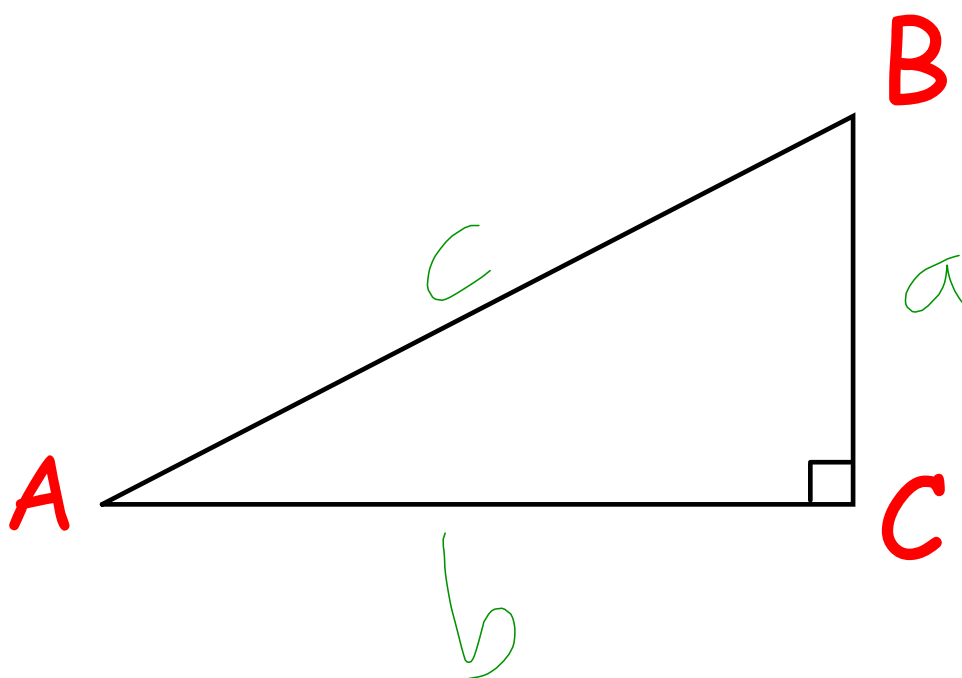
Minds on

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

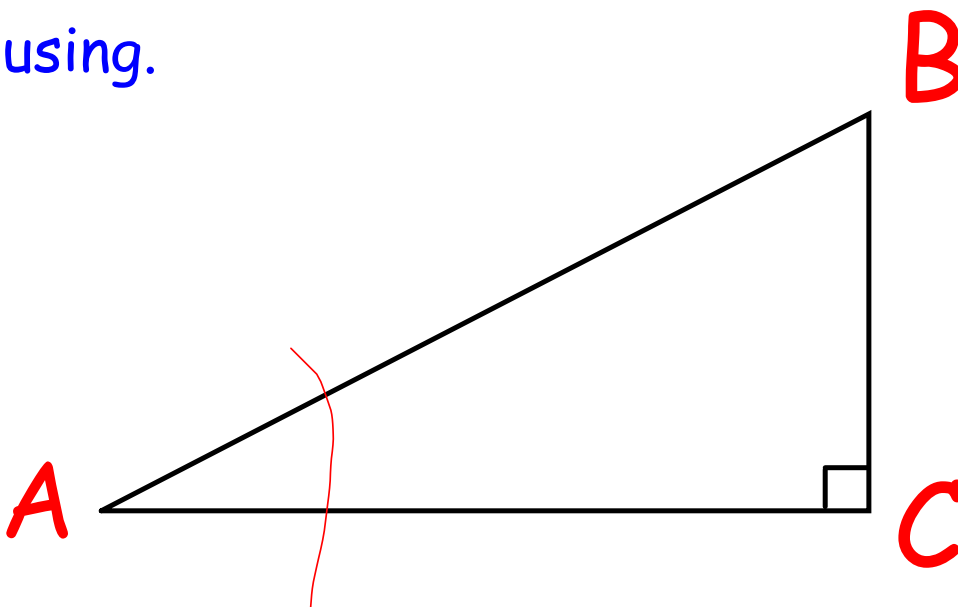
reference angle .

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:

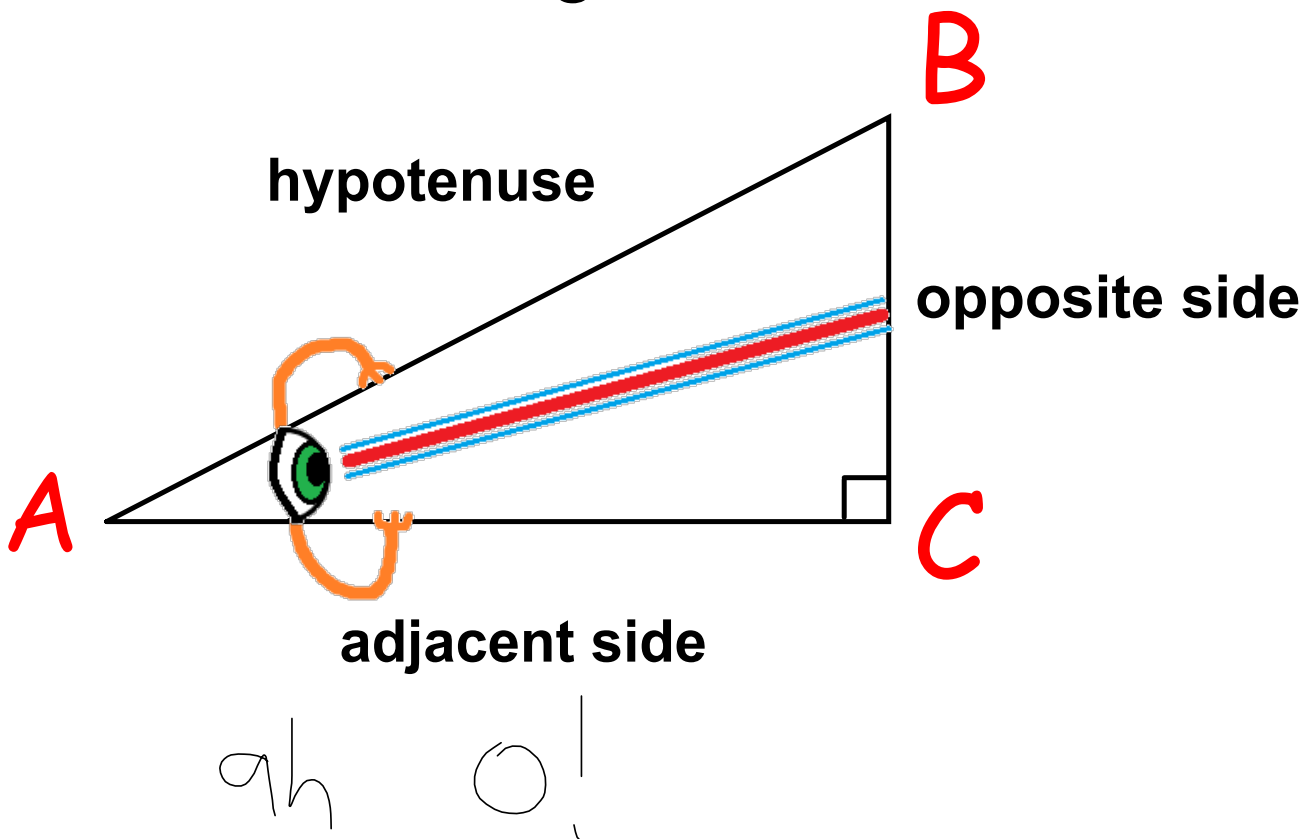
opposite side

adjacent side

hypotenuse

Minds on

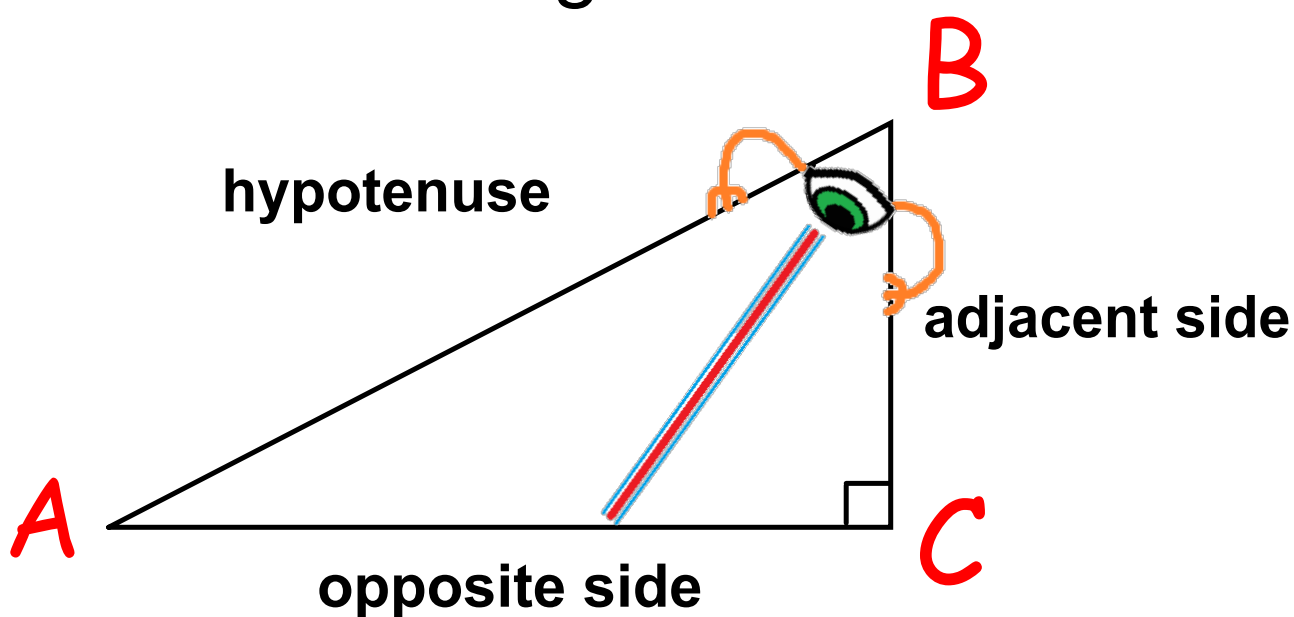
The Angle Monster



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

Minds on

The Angle Monster

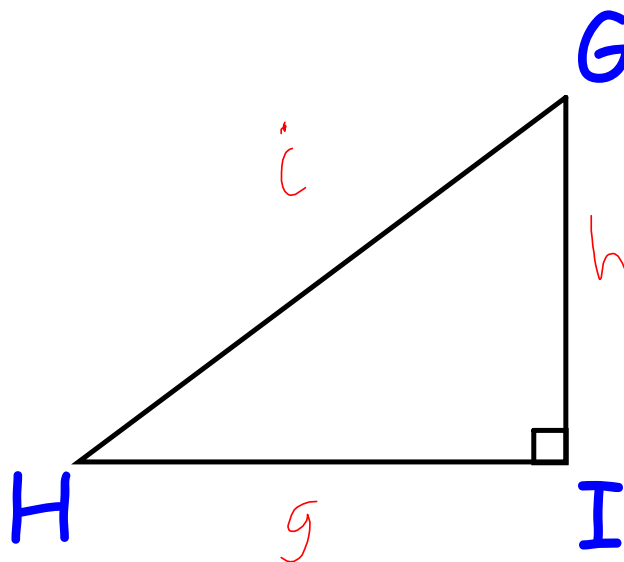


The angle monster always looks at his opposite side and hugs his adjacent side and his hypotenuse.

Minds on

Reference Angles

opposite: ~~_____~~
adjacent: ~~_____~~
hypotenuse: _____



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

Minds on

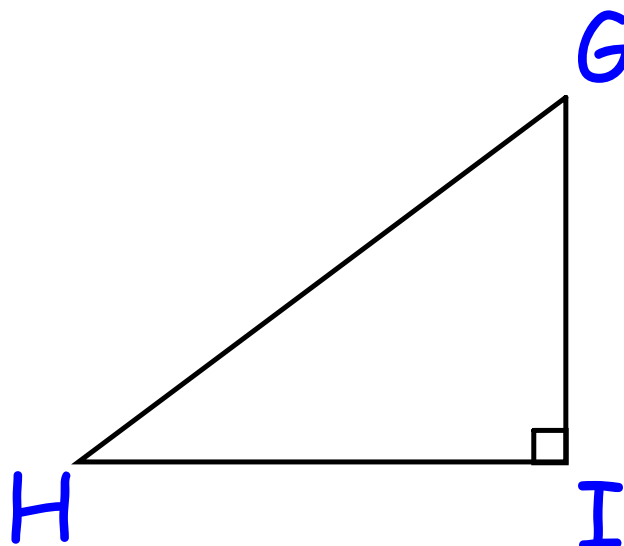
Reference Angles

Reference Angle: G

opposite: g

adjacent: h

hypotenuse: i



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

Minds on

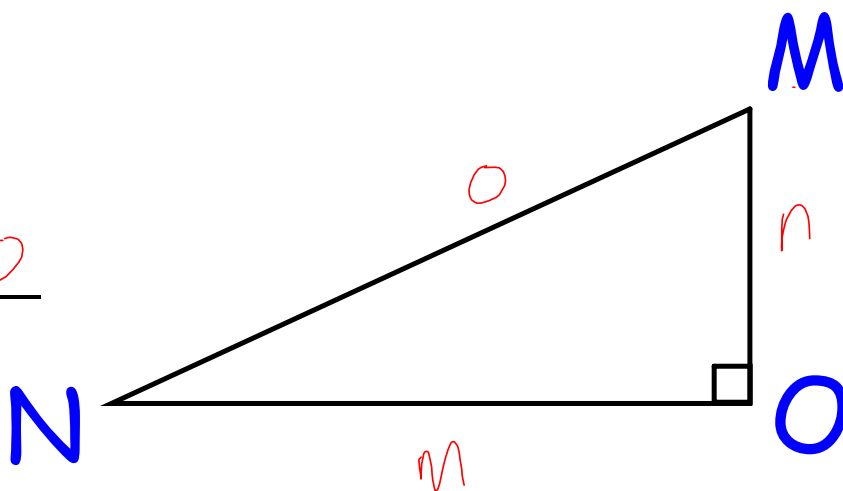
Reference Angles

Reference Angle: M

opposite: m

adjacent: n

hypotenuse: o



Minds on

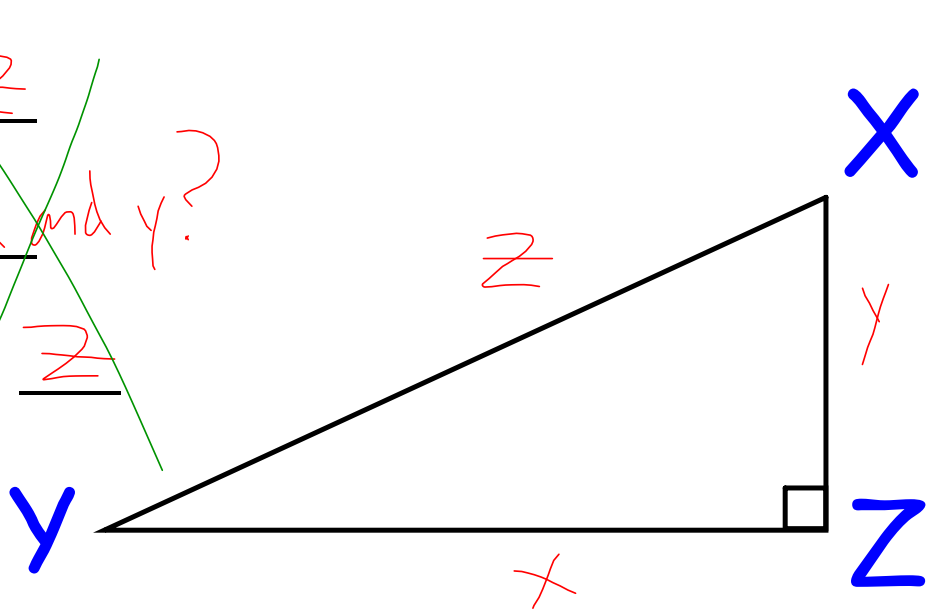
Reference Angles

Reference Angle: **Z**

opposite: Z

adjacent: x and y?

hypotenuse: Z

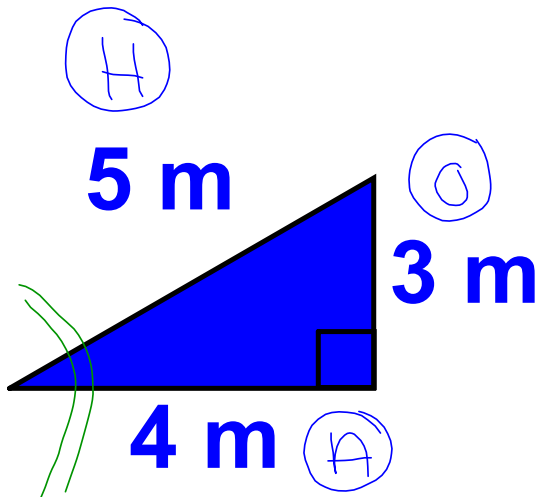


**NEVER USE THE RIGHT
ANGLE (90°) AS A
REFERENCE ANGLE!!!!**

Fillin' in the Blanks

Use your notes to fill in the blanks.

Stop when you get to "The Ratios"

Action!

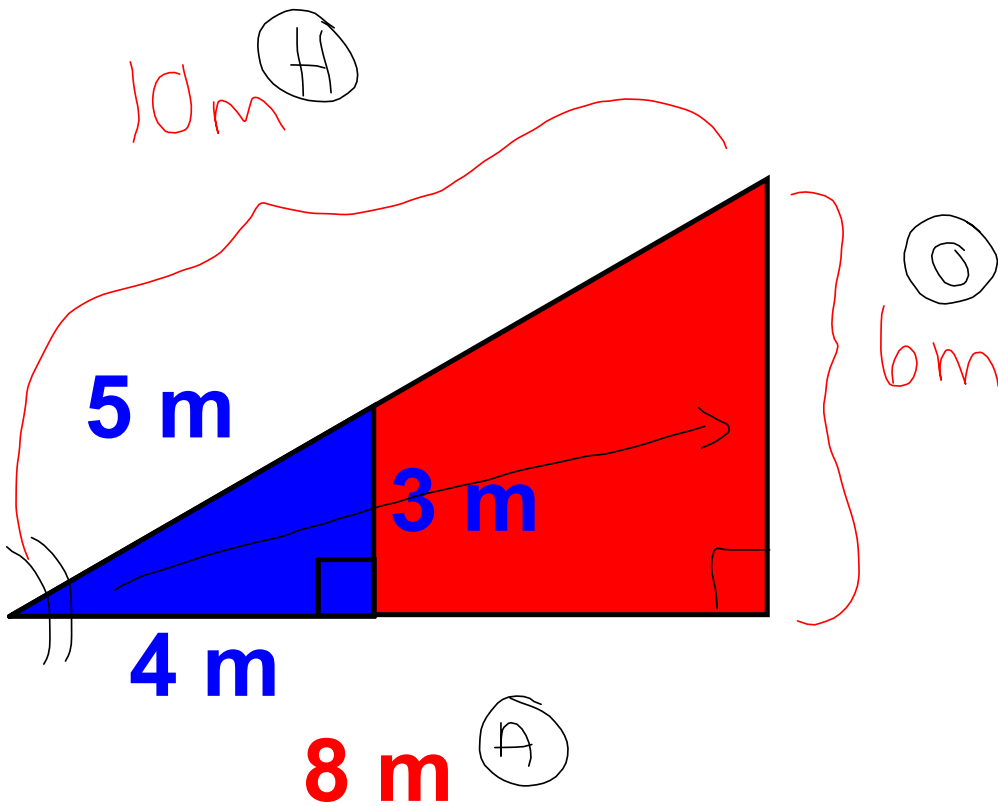
Ratios of Sides

$$\frac{\textit{opposite}}{\textit{hypotenuse}}$$
$$\frac{3}{5}$$
$$= 0.6$$

$$\frac{\textit{adjacent}}{\textit{hypotenuse}}$$
$$\frac{4}{5}$$
$$= 0.8$$

$$\frac{\textit{opposite}}{\textit{adjacent}}$$
$$\frac{3}{4}$$
$$= 0.75$$

Action!

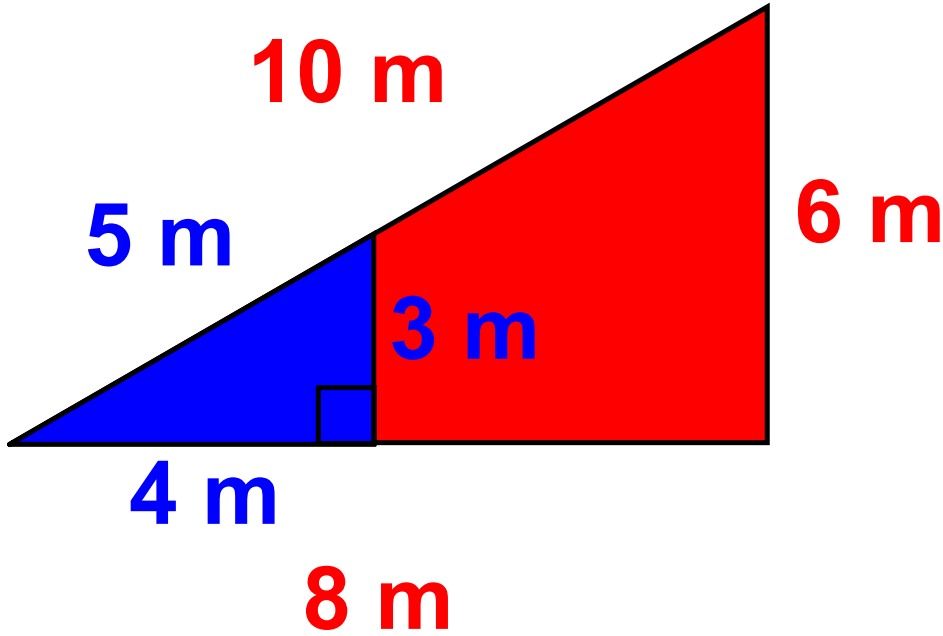


$$\frac{\text{opp}}{\text{hyp}} = \frac{6}{10} = 0.6$$

$$\frac{\text{adj}}{\text{hyp}} = \frac{8}{10} = 0.8$$

$$\frac{\text{opp}}{\text{adj}} = \frac{6}{8} = 0.75$$

Action!



Ratios of Sides

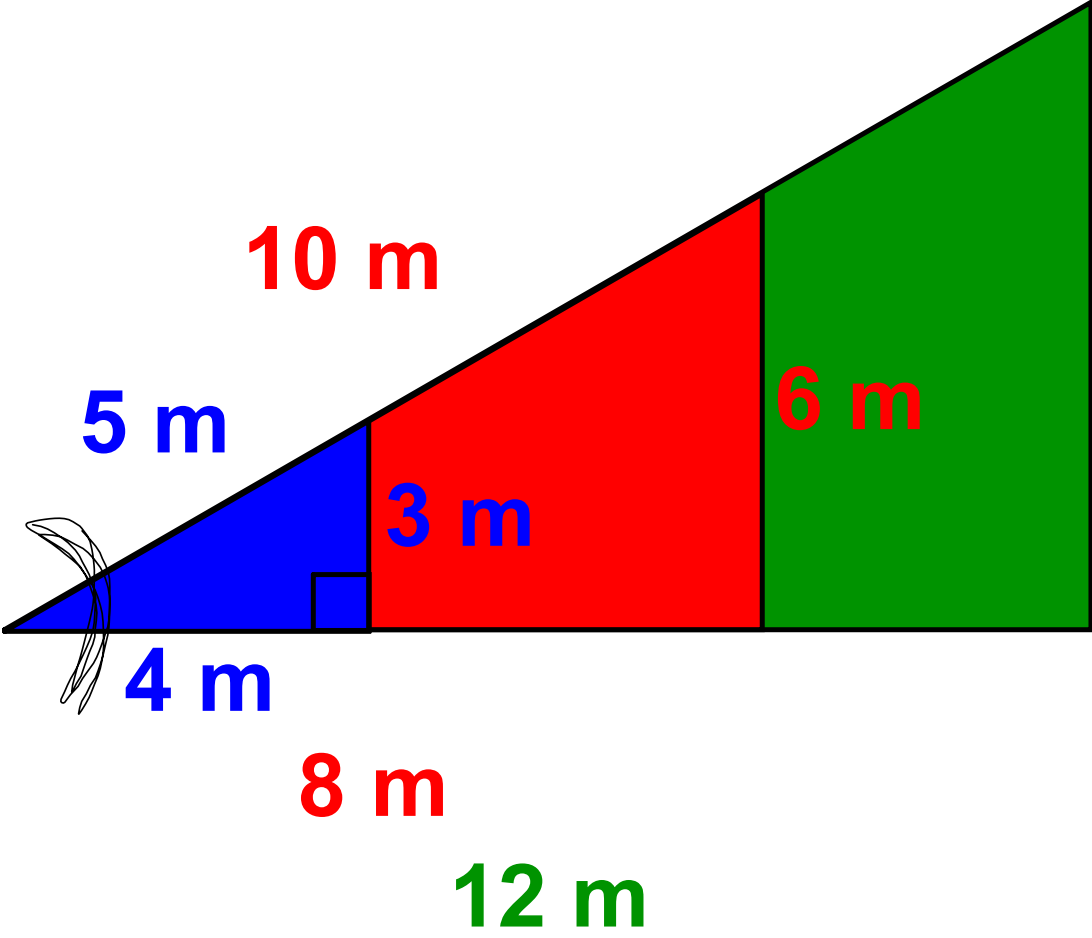
$$\frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\frac{\textit{adjacent}}{\textit{hypotenuse}}$$

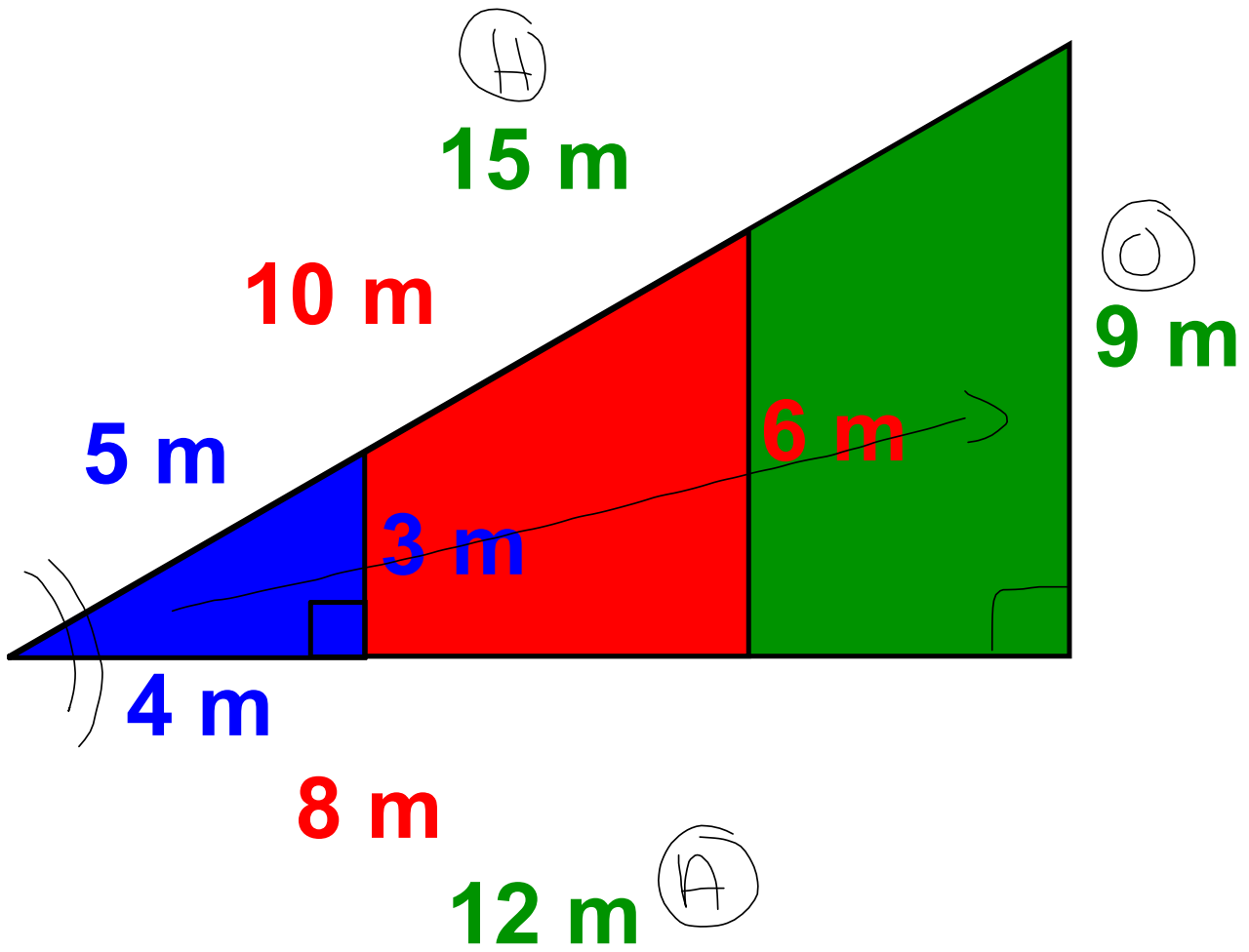
$$\frac{\textit{opposite}}{\textit{adjacent}}$$



Action!



Action!



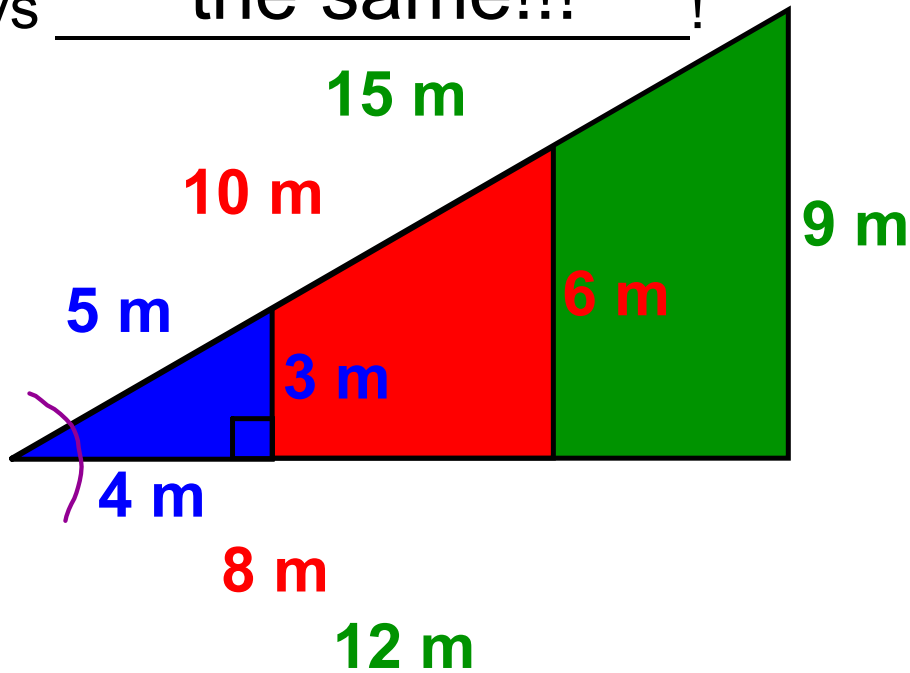
Ratios of Sides

$$\frac{\text{opposite}}{\text{hypotenuse}} = \frac{9}{15} = 0.6$$

$$\frac{\text{adjacent}}{\text{hypotenuse}} = \frac{12}{15} = 0.8$$

$$\frac{\text{opposite}}{\text{adjacent}} = \frac{9}{12} = 0.75$$

For any given reference angle, the ratios of the sides (opposite, adjacent, hypotenuse) are always the same!!!!



Ratios of Sides

$$\frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$\frac{\textit{opposite}}{\textit{adjacent}}$$

<div style="display: flex; flex-direction: column; align-items: center;"> <div style="width: 20px; height: 20px; background-color: blue; margin-bottom: 10px;"></div> <div style="width: 20px; height: 20px; background-color: red; margin-bottom: 10px;"></div> <div style="width: 20px; height: 20px; background-color: green;"></div> </div>	}	0.6	0.8	0.75
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These ratios are so special that they have been given special names!

Do you remember what they are???

	Ratios of Sides	
$\frac{\text{SOH}}{\text{opposite}}$	$\frac{\text{CAH}}{\text{adjacent}}$	$\frac{\text{TOA}}{\text{opposite}}$
$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{\text{adjacent}}{\text{hypotenuse}}$	$\frac{\text{opposite}}{\text{adjacent}}$
Sine	Cosine	Tangent
(SIN)	(COS)	(TAN)

Action!

The Trigonometric Ratios

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

The "**sine**" of an angle tells you the ratio of the side opposite the angle to the hypotenuse.

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

The "**cosine**" of an angle tells you the ratio of the side adjacent the angle to the hypotenuse.

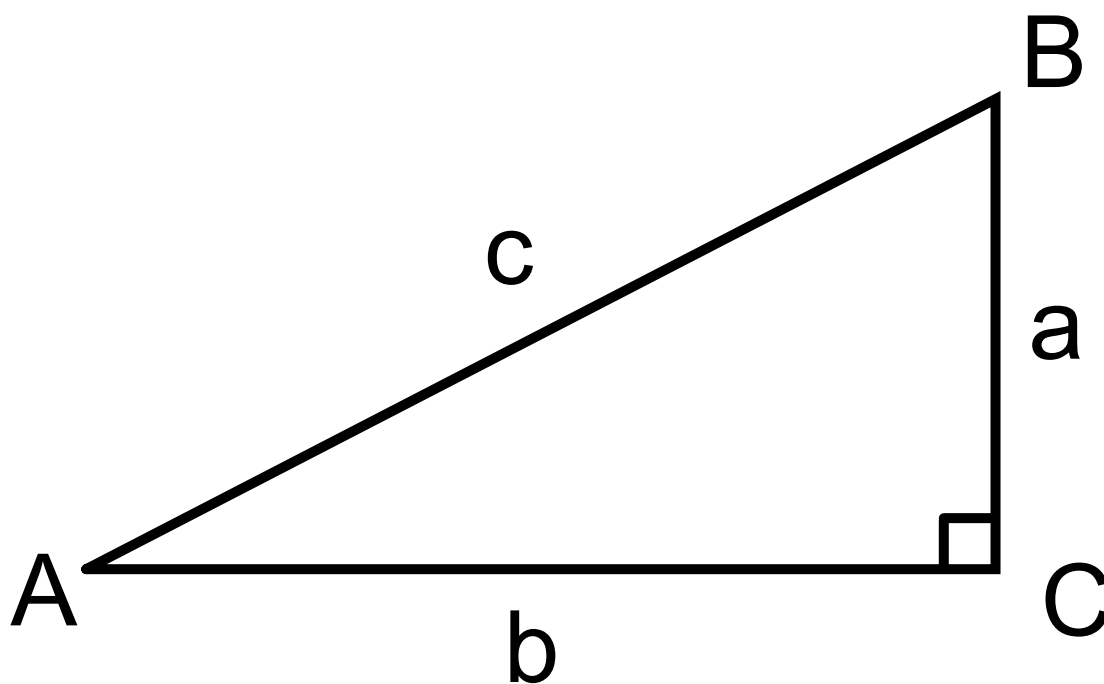
$$\tan(\text{angle}) = \frac{\text{opposite}}{\text{adjacent}}$$

The "**tangent**" of an angle tells you the ratio of the side opposite the angle to the side adjacent the angle.

Fillin' in the Blanks II

Use your notes to fill in the rest of the blanks on your sheet.

Put the sheet into your unit book!

Consolidation**The Ratios**

$$\sin A = \frac{a}{c}$$

$$\cos A = \frac{b}{c}$$

$$\tan A = \frac{a}{b}$$

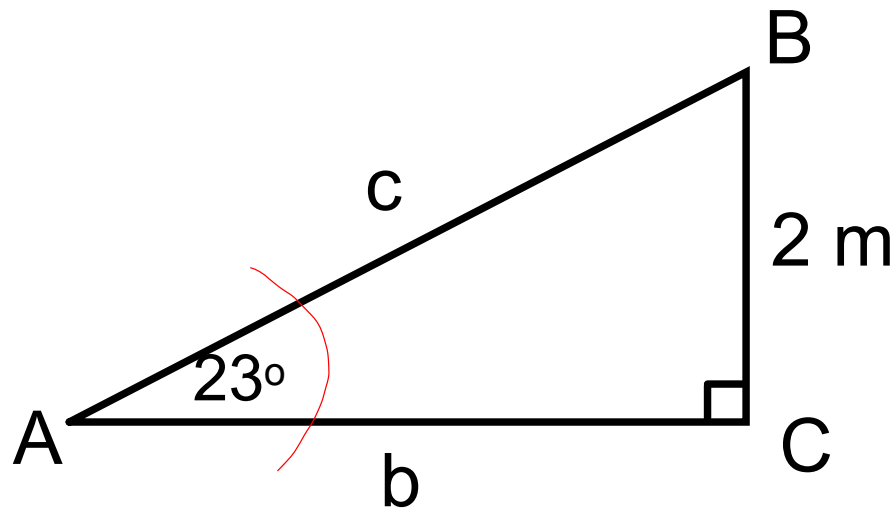
$$\sin B = \frac{b}{c}$$

$$\cos B = \frac{a}{c}$$

$$\tan B = \frac{b}{a}$$

Consolidation

The Ratios



Solve for side b

We have opposite \tan
we want adjacent

$$\tan 23^\circ = \frac{2}{b}$$

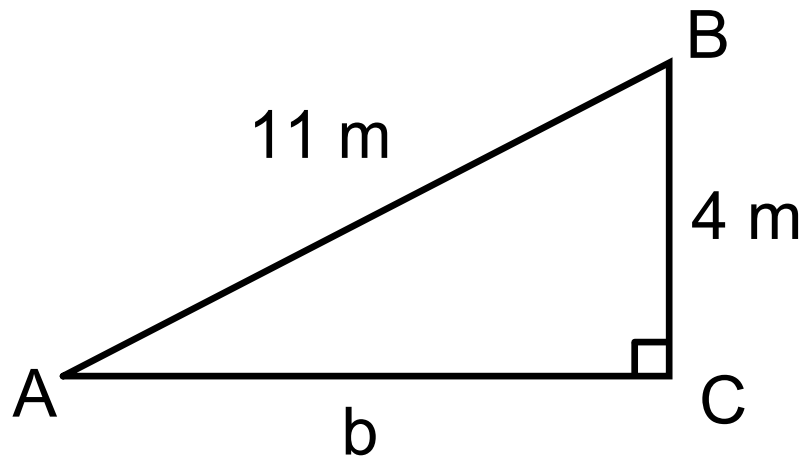
Solve for side c

We have opposite \sin
we want hypotenuse

$$\sin 23^\circ = \frac{2}{c}$$

Consolidation

The Ratios

**Solve for angle A**

we have opposite & hypotenuse

Soh

$$\sin A = \frac{4}{11}$$

Solve for angle B

we have adjacent

we have hypotenuse

CaH

$$\cos B = \frac{4}{11}$$

Practicing the Skills

Use your iPad notes and your handout to work through the examples on your sheet.

You don't need to actually solve yet, just set it up to solve it!

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 YOU
!!