## - Trigonometric Ratios Introduction

Geometry

A BowerPoint Presentation

### **Right Triangle Ratios**

#### • $\triangle ABC$ has three angles...

- >  $\measuredangle C$  is a right angle
- >  $\triangleleft A$  and  $\triangleleft B$  are acute angles

• We can make ratios related to the acute angles in  $\triangle ABC$ 



### Choose an acute angle

• Let's start with  $\angle A$ !

• We need to label the three sides of the triangle with their positions relative to  $\angle A$ .



## Label the hypotenuse (hyp)

# Label the side that is the hypotenuse This side is always across from the right angle



## Label the hypotenuse (hyp)

# Label the side that is the hypotenuse This side is always across from the right angle



### Label the opposite leg (opp)

### • Label the leg opposite from $\measuredangle A$

> This leg doesn't touch  $\measuredangle A$  at all – it is across the triangle from  $\measuredangle A$ .



### Label the opposite leg (opp)

### • Label the leg opposite from $\angle A$

> This leg doesn't touch  $\measuredangle A$  at all – it is across the triangle from  $\measuredangle A$ .



### Label the adjacent leg (adj)

# ■ Label the leg adjacent to ∡A > This leg does touch ∡A - it helps to make ∡A.



### Label the adjacent leg (adj)

# Label the leg adjacent to \$\nu\$A This leg does touch \$\nu\$A - it helps to make \$\nu\$A.



## Tangent [ $\tan \theta$ ]

The tangent (tan) ratio involves only the legs of the triangle.

> We will use opp and adj



## Tangent [ $\tan \theta$ ]

# $\tan \theta = \frac{\text{opp}}{\text{adj}}$



## Tangent [ $\tan \theta$ ]



### Sine [sin $\theta$ ]

The sine (sin) ratio involves the hypotenuse and one of the legs.
We will use opp and hyp





# $sin \theta = \frac{opp}{hyp}$





### Cosine $[\cos \theta]$

The cosine (cos) ratio also involves the hypotenuse and one of the legs.
We will use adj and hyp



### Cosine $[\cos \theta]$

# $\cos \theta = \frac{\text{adj}}{\text{hyp}}$



### Cosine $[\cos \theta]$



### Hard to remember?

There's a simple memory trick for these trigonometric ratios...

### SOH - CAH - TOA

### • sin θ = Opp / Hyp

### • $\underline{\mathbf{C}}$ OS $\theta = \underline{\mathbf{A}}$ dj / $\underline{\mathbf{H}}$ yp

### • $\underline{\mathbf{t}}$ an $\theta = \underline{\mathbf{O}}$ pp / $\underline{\mathbf{A}}$ dj

### Your turn!

### Find sin X, cos X, and tan X

- > Remember to label hyp, opp, & adj
- Find answers as both fractions and decimals (rounded to four places)



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