7-1: Trigonometric Ratios Notes Triumphant Trigonometer: Date:

Warm Up: What did we learn from the card activity with your table partners?

Ratio of side lengths in Δs are same if Δs have same angle measures.

Trigonometric Ratios: Sine, Cosine, Tangent

Trigonometric: shape, study of measures

Sine = **O**pposite / **H**ypotenuse

Cosine = **A**djacent / **H**ypotenuse

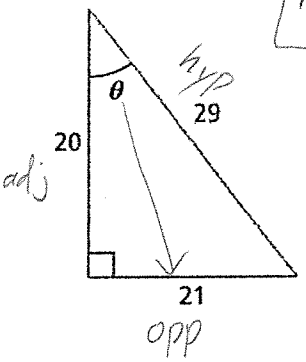
Tangent = **O**pposite / **A**djacent

Always a right triangle

1. Write the trigonometric ratios for sine, cosine, and tangent of theta (θ) from the triangles below.

hypotenuse = longest side

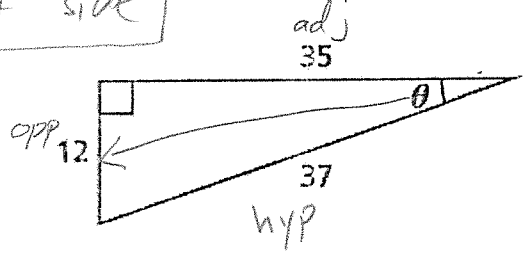
S O H C A H T O A



$\sin(\theta) = \frac{21}{29}$

$\cos(\theta) = \frac{20}{29}$

$\tan(\theta) = \frac{21}{20}$



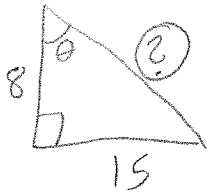
$\sin(\theta) = \frac{12}{37}$

$\cos(\theta) = \frac{35}{37}$

$\tan(\theta) = \frac{12}{35}$

2. Knowing that $\tan(\theta) = \frac{15}{8}$, write the other 2 trigonometric ratios for θ.

$\tan(\theta) = \frac{opp}{adj} = \frac{15}{8}$



$A^2 + B^2 = C^2$ ← Always hypotenuse

$8^2 + 15^2 = c^2$

$64 + 225 = c^2$

$289 = c^2$

$17 = c$ = hyp

$\sin(\theta) = \frac{opp}{hyp} = \frac{15}{17}$

$\cos(\theta) = \frac{adj}{hyp} = \frac{8}{17}$

3. What are the trigonometric ratios of an angle θ in a right triangle with $sin(\theta) = \frac{24}{25}$?

4. A fire truck has an 84 ft ladder extended against a building forming a 55° angle with the top of the truck. The truck is 8 feet tall. The firefighters are trying to reach a window that is 75 feet above the ground. Will they be able to reach the window using the ladder set at this angle? (You may want to draw out a picture).

5. The sun shines at a 60° angle to the ground. How long is the shadow cast by a 20 feet tall flagpole?