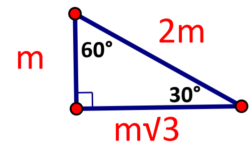
Geometry (G.SRT.6) Name: ______________________________

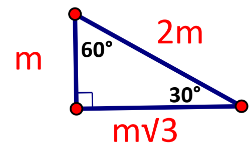
Unit Two: Trigonometry - Day 2 (IC21) Date: _________________ Period: ______

1. Earlier we learned about two very special triangles, the 30°-60°-90° and the 45°-45°-90°. Use the side relationships that we learned to determine the exact values for sine, cosine and tangent for the angles of 30°, 60° and 45°. (Why didn't I have to provide any measurements for the sides.....?)

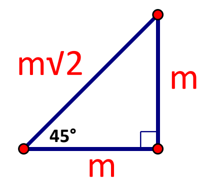
$\sin 30° = \dfrac{m}{2m} = \dfrac{1}{2}$ $\cos 30° = \dfrac{m\sqrt{3}}{2m} = \dfrac{\sqrt{3}}{2}$ $\tan 30° = \dfrac{m}{m\sqrt{3}} = \dfrac{1}{\sqrt{3}}$



$\sin 60° = \dfrac{m\sqrt{3}}{2m} = \dfrac{\sqrt{3}}{2}$ $\cos 60° = \dfrac{m}{2m} = \dfrac{1}{2}$ $\tan 60° = \dfrac{m\sqrt{3}}{m} = \dfrac{\sqrt{3}}{1}$

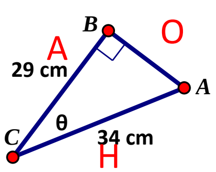


$\sin 45° = \dfrac{m}{m\sqrt{2}} = \dfrac{1}{\sqrt{2}}$ $\cos 45° = \dfrac{m}{m\sqrt{2}} = \dfrac{1}{\sqrt{2}}$ $\tan 45° = \dfrac{m}{m}$



2. Label the sides based of the triangle using the reference angle -- (O) for Opposite, (A) for Adjacent and (H) for Hypotenuse. After you have labeled the triangle, then choose which trigonometric ratio that you would use to solve for the missing info.

a)



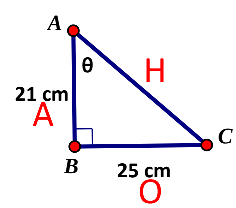
To solve: $\cos\Theta = \frac{29}{34}$

$\Theta = \cos^{-1}\left(\frac{29}{34}\right)$

$\Theta = 31.47°$

SIN **COS** **TAN**

b)



To solve: $\tan\Theta = \frac{25}{21}$

$\Theta = \tan^{-1}\left(\frac{25}{21}\right)$

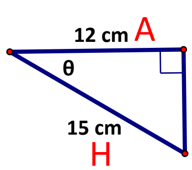
$\Theta = 49.97°$

SIN **COS** **TAN**

NOTE to solve for missing angles, inverse trig ratios must be used

3. Solve for the angle. (Round all final answers to 2 decimals places)

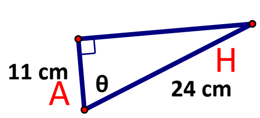
a)



$\Theta = \cos^{-1}\left(\frac{12}{15}\right)$

θ ≈ 36.87° ________

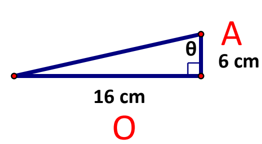
b)



$\Theta = \cos^{-1}\left(\frac{11}{24}\right)$

θ ≈ 62.72° ________

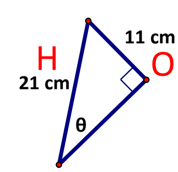
c)



$\Theta = \tan^{-1}\left(\frac{16}{6}\right)$

θ ≈ 69.44° ________

d)

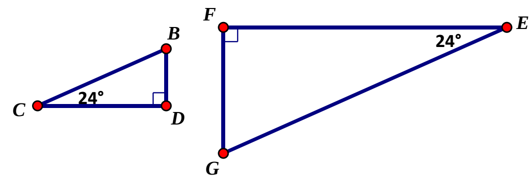


$\Theta = \sin^{-1}\left(\frac{11}{21}\right)$

θ ≈ 31.59° ________

3. **Thomas sees two triangles on the board in geometry class. From those he makes two claims:**

#1) that $\frac{CD}{CB} = \frac{EF}{EG}$**. How could he know this without having any numbers on the sides?**



Triangles are similar by AA~

#2) and that after clicking a couple of buttons on his calculator he states that $\frac{CD}{CB} = 0.9135$**. How could he know this without any numbers on the sides? What did he type into his calculator to get this value?**

$\cos 24 = \frac{CD}{CB}$

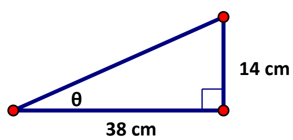
4. Sarah, the student who sits next to you in geometry class, notices that the values for sine and cosine are only from 0 to 1 for the angles 0° to 90°. She leans over and asks, "Why can't sine and cosine be greater than 1?" How would you respond to her?

$\sin \Theta = \frac{opp}{hyp}$

$\cos \Theta = \frac{adj}{hyp}$

Since the hypotenuse is ALWAYS the longest side of a Δ, these are always $\frac{small \#}{big \#}$ which is less than 1 and positive so greater than zero

5. A student who did very well in Algebra 1 looked at this trigonometry problem, and said "What a minute, Tangent is the same as slope!!" Why would she says this? How is tangent the same as slope?



The opp side is like "rise"
The adj side is like "run"

$\tan \Theta = \frac{opp}{adj} = \frac{rise}{run}$

6. At 45°, the tangent value = 1.

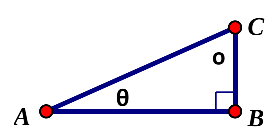
a) What does that mean about the opposite and adjacent sides?

They are the same

b) A student notices that angles greater than 45° produce a ratio greater than 1. What does this mean about the opposite and adjacent sides?

opp side > adjacent side
for reference angles greater than 45°

7. Jessy claims that $\overline{AB}$ **is the opposite side. Is he correct? Explain.**



If <C is the reference angle, Jessy is correct.