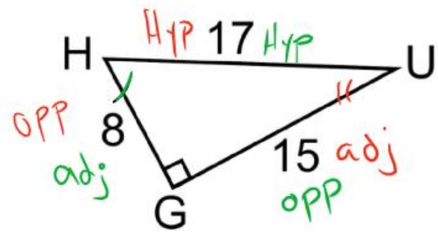
Right Triangle Trigonometry Review

Name_____________________________

1. Identify the sine, cosine, and tangent of both acute angles.



$S\frac{O}{H}$ $C\frac{A}{H}$ $T\frac{O}{A}$

$\sin(H) = \frac{15}{17}$ $\sin(U) = \frac{8}{17}$

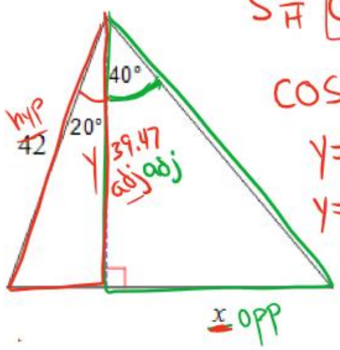
$\cos(H) = \frac{8}{17}$ $\cos(U) = \frac{15}{17}$

$\tan(H) = \frac{15}{8}$ $\tan(U) = \frac{8}{15}$

2. In triangle MNO, where N is a right angle, what trig. function is congruent to cos(M)? What do we know because they are complementary angles?

$\cos(m) = \sin(o)$

3. a. Solve for x. Round to the nearest hundredth.



$S\frac{O}{H}$ $\boxed{C\frac{A}{H}}$ $\boxed{T\frac{O}{A}}$

$\cos(20) = \frac{y}{42}$

$y = 42 \cdot \cos(20)$

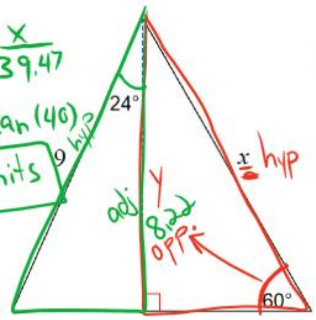
$y = 39.47$ units

$\tan(40) = \frac{x}{39.47}$

$x = 39.47 \cdot \tan(40)$

$\boxed{x = 33.12 \text{ units}}$

3 b. Solve for x. Round to the nearest thousandth.



$\boxed{S\frac{O}{H}}$ $\boxed{C\frac{A}{H}}$ $T\frac{O}{A}$

$\cos(24) = \frac{y}{9}$

$y = 9 \cdot \cos(24)$

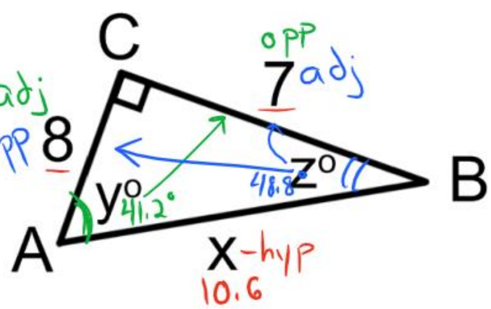
$y = 8.222$

$\sin(60) = \frac{8.222}{x}$

$x = \frac{8.222}{\sin(60)}$

$\boxed{x = 9.494}$

4. Solve for the variables. Round to the nearest tenth.



X

$a^2 + b^2 = c^2$

$7^2 + 8^2 = x^2$

$49 + 64 = x^2$

$\sqrt{113} = \sqrt{x^2}$

$10.6 = x$ units

Y $T\frac{O}{A}$

$\tan(y) = \frac{7}{8}$

$y = \tan^{-1}\left(\frac{7}{8}\right)$

$y = 41.2°$

Z $T\frac{O}{A}$

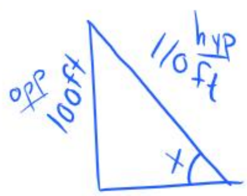
$\tan(z) = \frac{8}{7}$

$z = \tan^{-1}\left(\frac{8}{7}\right)$

$z = 48.8°$

41.2
48.8
90.0 ✓

5. A fire department's longest ladder is 110 feet long, and the safety regulation states that they can use it for rescues up to 100 feet off the ground. What is the maximum safe angle of elevation for the rescue ladder? Round to the nearest degree.



$S\frac{O}{H}$

$\sin(x) = \frac{100}{110}$

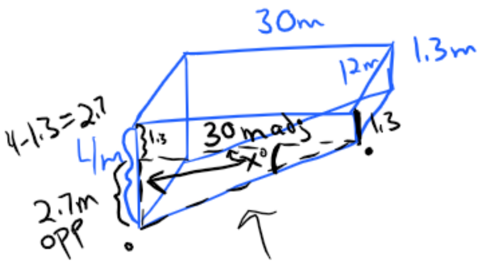
$x = \sin^{-1}\left(\frac{100}{110}\right)$

$x = 65°$

Max safe angle of elevation is 65°.

6. Challenge: A swimming pool is 30 meters long and 12 meters wide. The bottom of the pool is slanted so that the water depth is 1.3 meters at the shallow end and 4 meters at the deep end. Find the angle of depression of the bottom of the pool. Round to the nearest degree.

$\boxed{T\ \frac{O}{A}}$

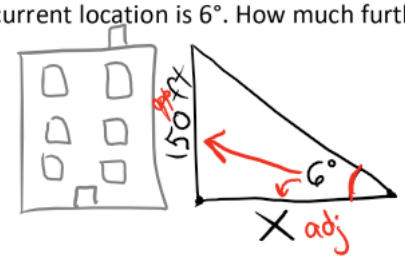


$\tan(x) = \frac{2.7}{30}$

$x = \tan^{-1}\left(\frac{2.7}{30}\right)$

$x = 5°$ is the angle of depression of the bottom of the pool.

7. Ophelia Payne is walking to her office building which she knows is 150ft high. The angle to the top of the building from her current location is 6°. How much further does she need to walk? Round to the nearest tenth.



$S\frac{O}{H}\ C\frac{A}{H}\ \boxed{T\frac{O}{A}}$

$\tan(6) = \frac{150}{x}$

$x = \frac{150}{\tan(6)}$

Ophelia needs to walk $x = 1{,}427.2$ ft

8. In triangle YAM where M is a right angle, the sin(A)=12/15, find the following.

opp / hyp

$S\frac{O}{H}$

$S\frac{O}{H}\ C\frac{A}{H}\ T\frac{O}{A}$

a. Missing side: 9

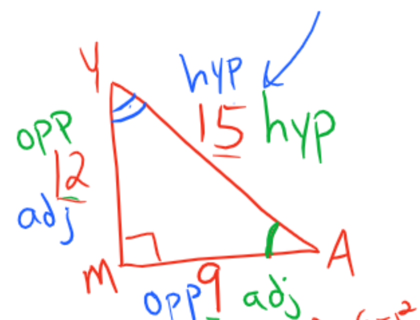
b. cos(A)= $\frac{9}{15}$

c. tan(A)= $\frac{12}{9}$

d. sin(Y)= $\frac{9}{15}$

e. cos(Y)= $\frac{12}{15}$

f. tan(Y)= $\frac{9}{12}$



$(12)^2 + b^2 = (15)^2$

$144 + b^2 = 225$

$\sqrt{b^2} = \sqrt{81}$

$b = 9$

9. In triangle CAR where C is a right angle, the $\boxed{\sin(A)=20/29}$, find the following.

opp / Hyp

a. Missing side: 21

b. cos(A)= $\frac{21}{29}$

c. tan(A)= $\frac{20}{21}$

d. $m\angle A$ = 43.603°

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

$A = \tan^{-1}\left(\frac{20}{21}\right) = 43.603°$

$43.603 + 46.397 = 90.000°$

e. sin(R)= $\frac{21}{29}$

f. cos(R)= $\frac{20}{29}$

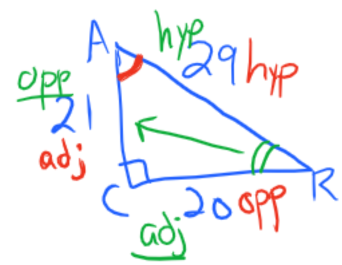
g. tan(R)= $\frac{21}{20}$

h. $m\angle R$ = 46.397°

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

$R = \tan^{-1}\left(\frac{21}{20}\right)$

$R = 46.397°$



$20^2 + b^2 = 29^2$

$400 + b^2 = 841$

$\sqrt{b^2} = \sqrt{441}$

$b = 21$