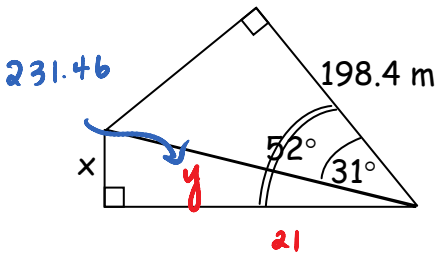
Word Problem Warm Up Challenge!

1. A piece of land has the shape shown. Find x.



$\cos 31 = \frac{198.4}{y}$

$y \cos 31 = 198.4$

$y = 198.4 / \cos 31$

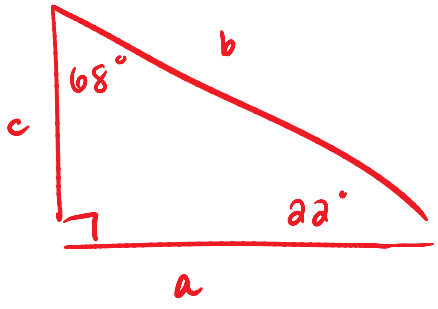
$y \approx 231.46$

$\sin 21 = \frac{x}{231.46}$

$x = 231.46 \sin 21$

$x \approx 82.95$

2. How does the sin, cos, and tan of 22 compare to the sin, cos, and tan of 68?

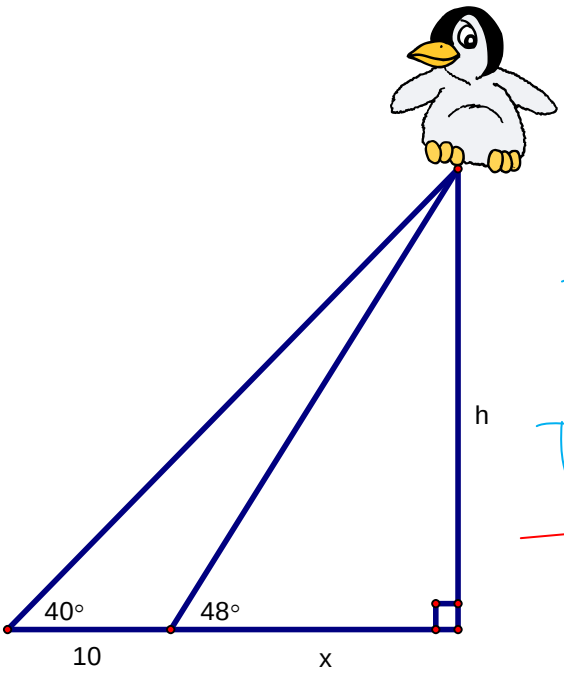


$\sin 22 = \frac{c}{b}$ $\quad \cos 68 = \frac{c}{b}$

$\cos 22 = \frac{a}{b}$ $\quad \sin 68 = \frac{a}{b}$

$\tan 22 = \frac{c}{a}$ $\quad \tan 68 = \frac{a}{c}$

3. A large, helium-filled penguin is tied to the ground by two large cables. The cables make angles of 48° *and* 40° with the ground. If the cables are attached to the ground 10 feet from each other, how high above the ground is the penguin?



$\tan 40 = \frac{h}{10+x}$

$\tan 48 = \frac{h}{x}$ ... $h = \tan 48 (x)$

$\tan 40 = \frac{\tan 48 (x)}{10+x}$

$\tan 40 (10) + \tan 40 (x) = \tan 48 (x)$

$x \approx 30$ $\quad y \approx 34.32$

4. What is the restrictions on the sine of an angle?

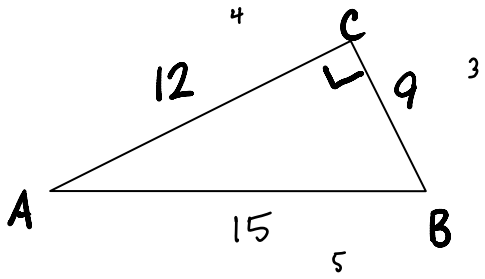
$\sin x = \frac{O}{H}$ ← Biggest side $\quad 0 < \sin x < 1$

Honors Geometry **9.9 & 9.10 Trig Review**

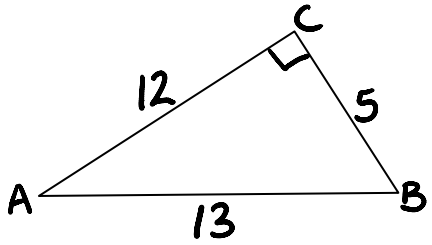
Round to the nearest hundredth unless otherwise noted!

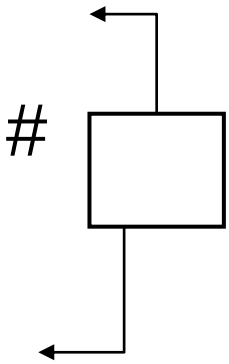
Remember, SOHCAHTOA! When you are finding a side length, use sin, cos, & tan. When you are finding an angle measure, use $\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$.

1. Find each ratio:
   a. $\sin\angle A$ $3/5$ d. $\sin\angle B$ $4/5$
   b. $\cos\angle A$ $4/5$ e. $\cos\angle B$ $3/5$
   c. $\tan\angle A$ $3/4$ f. $\tan\angle B$ $4/3$

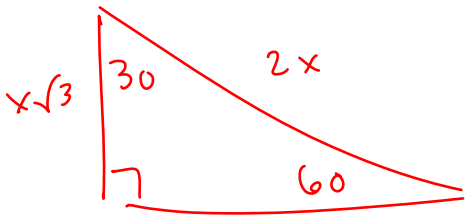


2. Using the figure as marked, fill in the blanks with the missing angle.
   a. $\frac{5}{12} = \tan\angle$ A
   b. $\frac{5}{13} = \cos\angle$ B
   c. $\frac{5}{13} = \sin\angle$ A

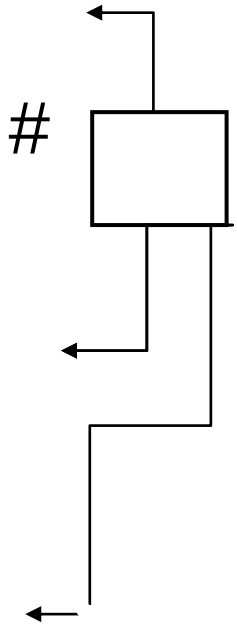




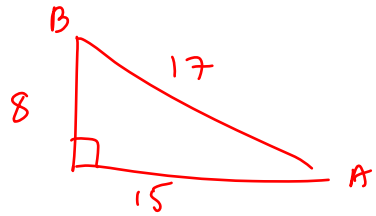
3. Find the cos60° without using a calculator (Hint: draw the special right Δ)



$\frac{x}{2x} = \frac{1}{2}$



4. Find the measures of the angles of an 8, 15, 17 triangle to the nearest tenth.

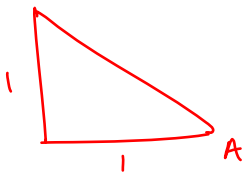


$\tan A = \frac{8}{15}$

$A = \tan^{-1}\left(\frac{8}{15}\right)$

$A = 28.1°$ $B = 61.9°$

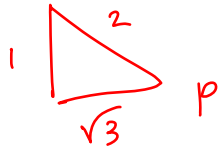
5. Draw triangles to answer these!
   a. If $\tan\angle A = 1$, find $m\angle A$.



$45°$

   b. If $\sin\angle P = 0.5$, find $m\angle P$.

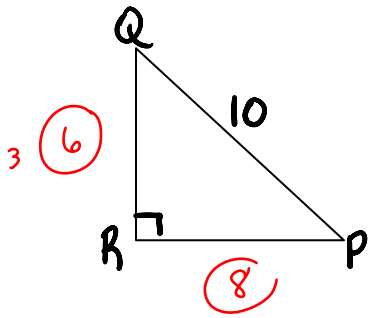
$\frac{1}{2}$



$30°$

6. Given: $\sin\angle P = \frac{3}{5}$, PQ = 10

   Find: $\cos\angle P$



$\frac{8}{10} = \boxed{\frac{4}{5}}$

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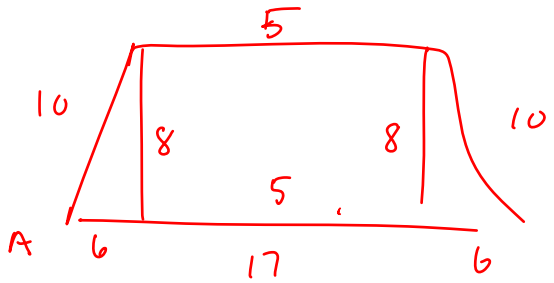
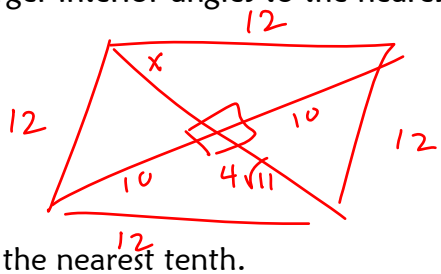
7. Given a trapezoid with sides 5, 10, 17, and 10, find the sine of one of the acute angles.



$\tan A = \frac{8}{6}$

$A = 53.1^\circ$.

8. Given a rhombus with sides of 12 and the longer diagonal of length 20, find the measure of one of the larger interior angles to the nearest tenth.



$\sin x = \frac{10}{12}$

$x = 56.4$

$\boxed{x = 112.8^\circ}$ #

9. Solve each equation for x to the nearest tenth.

   a. $\sin 25° = \frac{x}{40}$ b. $\cos 73° = \frac{35}{x}$ c. $\sin x° = \frac{29}{30}$

$40 \sin 25 = x$

16.9

$x \cos 73 = 35$

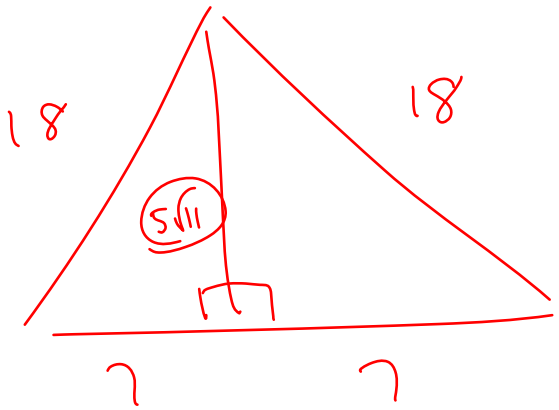
$x = 119.7$

$30 \sin x = 29$

$\sin x = \frac{29}{30}$

$x = 75.2^\circ$

10. The legs of an isosceles triangle are each 18. The base is 14.
    a. Find the base angles to the nearest degree.
    b. Find the exact length of the altitude to the base.



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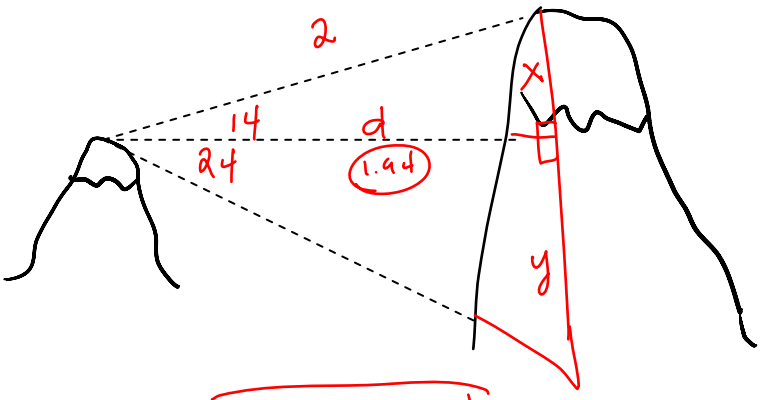
~~SIN~~ $\cos A = \frac{7}{18}$

$A = 67.1$

11. While at the top of a small mountain, you stare out at a larger mountain in the distance. You know the distance between the mountain tops is 2 miles. If you measure the angle of depression to the base of the larger mountain to be 24 degrees and the angle of elevation to the top of the mountain to be 14 degrees, how tall is the larger mountain?



$\sin 14 = \frac{x}{2}$ $\quad \cos 14 = \frac{d}{2}$

$x \approx 2\sin 14$ $\quad d = 2\cos 14$

$\approx .48$ $\quad d \approx 1.94$

$\tan 24 = \frac{y}{1.94}$

$y = 1.94 \tan 24$

$y = .86$

$x + y =$ 1.34 miles

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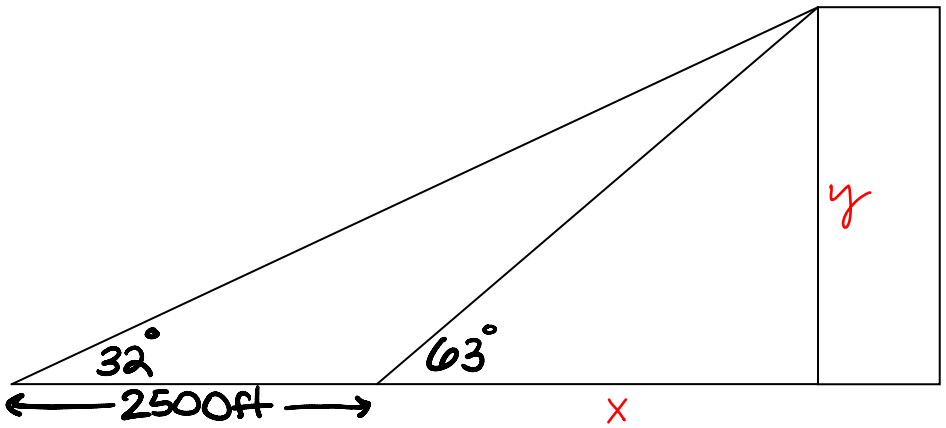
12. To determine the height of a tall building from a distance, you use a sextant to measure the angle when looking up at the top of the building to be 32 degrees. You move 2500 feet closer to the building and look up again. This time you measure the angle to the top of the building to be 63 degrees. How tall is the building?



$2500 + x$

$\tan 32 = \frac{y}{2500 + x}$ $\quad \tan 63 = \frac{y}{x}$

$x \tan 63 = y$

$y = \tan 32 (2500 + x)$

$2500 \tan 32 + x \tan 32 = x \tan 63$

$2500 \tan 32 = x \tan 63 - x \tan 32$

$2500 \tan 32 = x (\tan 63 - \tan 32)$

$\tan 63 = \frac{y}{x}$

$y = 2291.9$

$x = 1167.8$