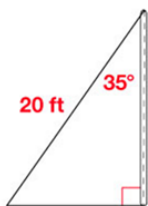
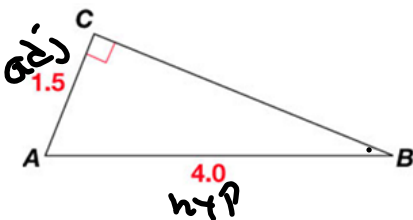


- 2 EXAMPLE** A 20-ft. wire supporting a flagpole forms a 35° angle with the flagpole. To the nearest foot, how high is the flagpole?



- 3 EXAMPLE** A right triangle has a leg 1.5 units long and hypotenuse 4.0 units long. Find the measures of its acute angles to the nearest degree. Draw a diagram using the information given.



$$\sin^{-1} B = \frac{1.5}{4.0}$$

$$m \angle B = 22.02^\circ$$


$$m \angle A = 90 - 22.02 = 67.98$$

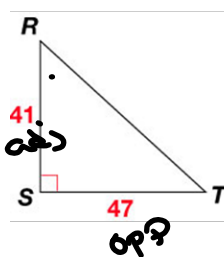
$$\cos^{-1} A = \frac{1.5}{4.0}$$

opp

2 Use Inverse Trigonometric Ratios In Example 2, you found that $\tan 30^\circ \approx 0.58$. It follows that if the tangent of an acute angle is 0.58, then the angle measures approximately 30.

If you know the sine, cosine, or tangent of an acute angle, you can use a calculator to find the measure of the angle, which is the inverse of the trigonometric ratio.

 Key Concept Inverse Trigonometric Ratios	
Words	If $\angle A$ is an acute angle and the sine of A is x , then the inverse sine of x is the measure of $\angle A$.
Symbols	If $\sin A = x$, then $\sin^{-1} x = m\angle A$.
Words	If $\angle A$ is an acute angle and the cosine of A is x , then the inverse cosine of x is the measure of $\angle A$.
Symbols	If $\cos A = x$, then $\cos^{-1} x = m\angle A$.
Words	If $\angle A$ is an acute angle and the tangent of A is x , then the inverse tangent of x is the measure of $\angle A$.
Symbols	If $\tan A = x$, then $\tan^{-1} x = m\angle A$.

3 EXAMPLEFind $m\angle R$ to the nearest degree.

$$\tan R = \frac{47}{41}$$

Find the tangent ratio.

$$m\angle R \approx \tan^{-1} \frac{47}{41}$$

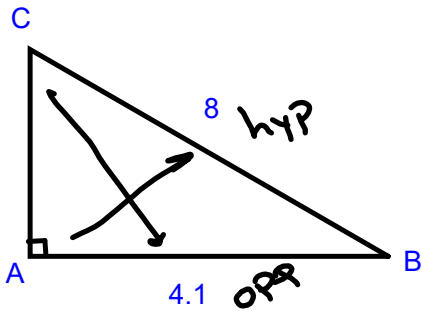
Use the inverse of the tangent.

$$\boxed{\text{TAN}^{-1}} \frac{47}{41} \boxed{\text{ENTER}} \underline{48.900494}$$

Use a calculator.

So $m\angle R \approx 49$.

Find the measures of the acute angles of the right triangle. Round your answer to the nearest degree.

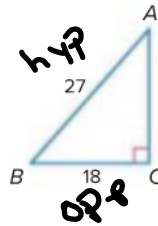


$$\sin^{-1} C = \frac{4.1}{8} = 31^\circ$$

$$m\angle B = 90 - 31 = 59^\circ$$

Use a calculator to find the measure of $\angle A$ to the nearest tenth.

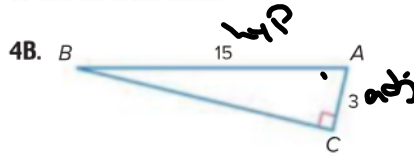
$$\sin^{-1} \angle A = \frac{18}{27} = 41.8^\circ$$



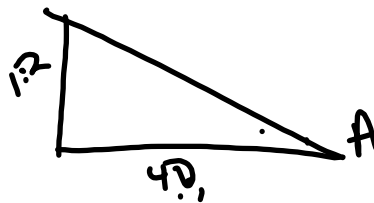
Use a calculator to find the measure of $\angle A$ to the nearest tenth.



$$\tan^{-1} A = \frac{6}{20} = 16.7$$



$$\cos^{-1} A = \frac{3}{15} = 78.5$$



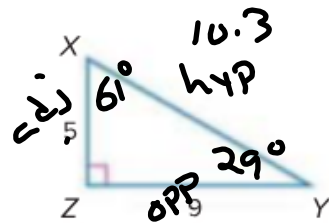
Example 5 Solve a Right Triangle

Solve the right triangle. Round side measures to the nearest tenth and angle measures to the nearest degree.

$$\tan^{-1} x = \frac{9}{5} = 61^\circ$$

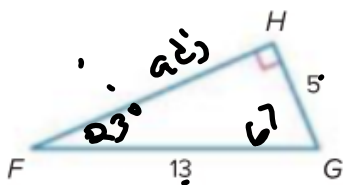
$$X \cdot \cos 61 = \frac{5}{X}$$

$$X \cos 61 = \frac{5}{\cos 61}$$



Solve each right triangle. Round side measures to the nearest tenth and angle measures to the nearest degree.

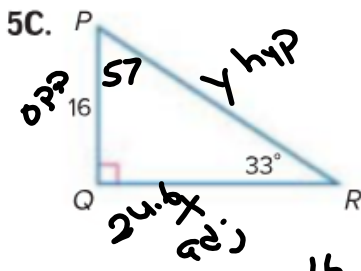
5A.



$$\sin^{-1} \frac{5}{13} = 23^\circ = 22.6$$

$$13 \cdot \cos 22.6 = \frac{x}{13} \cdot 13 \quad x = 12$$

Solve each right triangle. Round side measures to the nearest tenth and angle measures to the nearest degree.



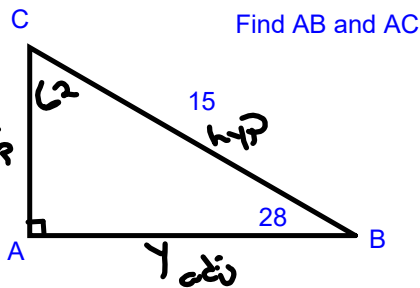
$$\tan 33 = \frac{16}{x}$$

$$x = \frac{16}{\tan 33}$$

$$\sin 33 = \frac{16}{y}$$

$$y = \frac{16}{\sin 33}$$

$$y = 29.4$$



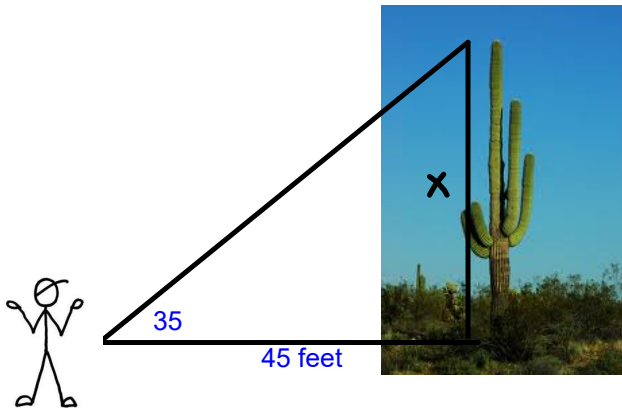
$$\sin 28 = \frac{x}{15}$$

$$x = 7$$

$$\cos 28 = \frac{y}{15}$$

$$y = 13.2$$

Find the height of the cactus.



$$\tan 35 = \frac{x}{45}$$

$$x = 31.5 \text{ ft}$$