

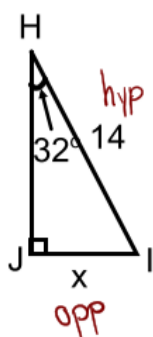
## Today's Standards

SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Basically, using RTT to find missing parts of right triangles.

Using Right Triangle Trig. (RTT) to find missing side lengths.

What is the value of x?



SOH CAH TOA

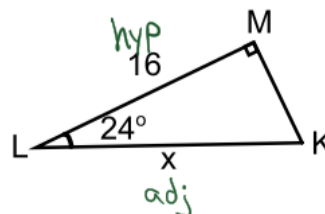
$$\sin(32) = \frac{x}{14}$$

$$x = 14 \sin(32)$$

$$x = 7.419$$

RTT Notes:

What is the value of x?



SOH CAH TOA

$$\cos(24) = \frac{x}{16}$$

$$x = 16 \cos(24)$$

$$x = 14.617$$

Steps to solving word problems.

1. Draw a picture with a right triangle
2. Label the given parts
3. Set up the trig ratios and solve for the missing part.

SOH CAH TOA

1. A ladder, 5 meters, long, leans against a building. If the angle between the ground and the ladder is 57 degrees, how far from the wall is the bottom of the ladder? Round the answer to the nearest tenth.

$$\cos(57) = \frac{x}{5}$$

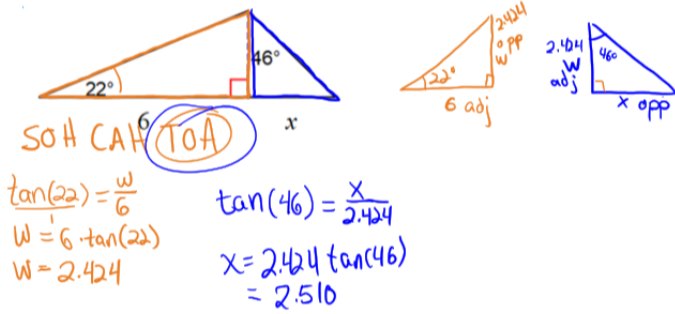
$$x = 5 \cos(57)$$

$$x = 2.723 \approx 2.7 \text{ ft}$$



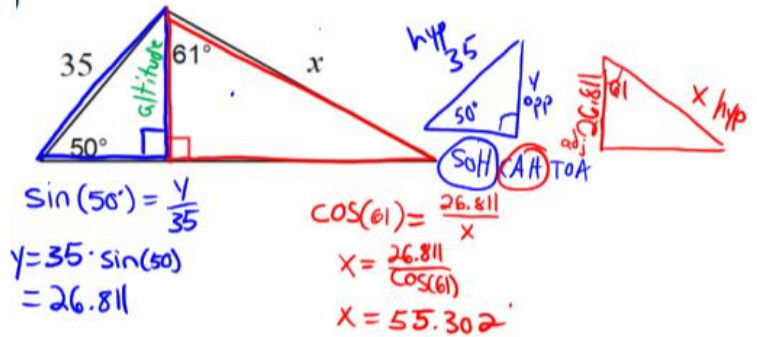
Let's step this up

Find the value of x.



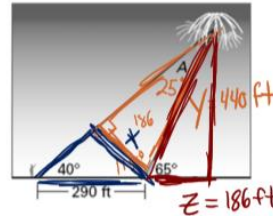
One more.

Find the value of x.



You are watching a fireworks display where you are standing 290 feet behind the launch pad. The launch tubes are aimed directly away from you at an angle of  $65^\circ$  with the ground. The angle for you to see the fireworks is  $40^\circ$ .

To the nearest foot, what is the horizontal distance from the launch pad to the point where the fireworks explode?



To the nearest foot, what is the height of the fireworks when they explode?

$$\sin(40) = \frac{x}{290}$$

$$x = 290 \sin(40)$$

$$x = 186 \text{ ft}$$

$$\sin(25) = \frac{186}{y}$$

$$y = \frac{186}{\sin(25)}$$

$$y = 440 \text{ ft}$$

$$\cos(65) = \frac{z}{440}$$

$$z = 440 \cdot \cos(65)$$

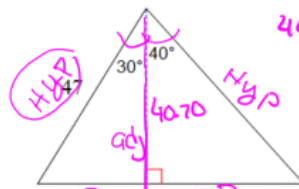
$$z = 186 \text{ ft}$$

Horizontal Distance

$$290 + 186 = 476 \text{ ft}$$

### CAH Recap & Think

Explain how you would find the value of x.

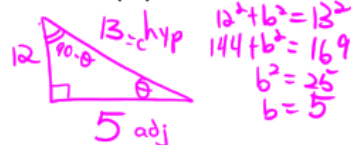


$$40.70 \cdot \tan(40) = \frac{x}{40.70}$$

$$x = 40.70 \cdot \tan(40)$$

$$x = 34.151$$

If the  $\sin(\theta) = 12/13$ , what is the  $\cos(\theta)$ ?  $\cos(90-\theta)$ ?



$$\cos(\theta) = \frac{5}{13}$$

$$\cos(90-\theta) = \frac{12}{13}$$

$$\sin(\theta) = \cos(90-\theta)$$

$$\sin(30) = \cos(60)$$

$$\sin(40) = \cos(50)$$