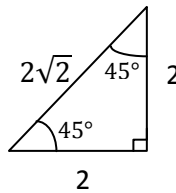
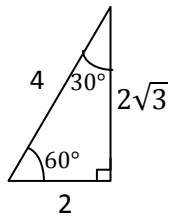


Self-Check 22 Right Triangle Trig

1. Solve for the missing parts of right triangle ABC given that side a measures 3 cm, side c measures 7 cm, and angle C is the right angle. Draw and label the triangle. Round all calculations to 2 decimal places.
2. A lighthouse keeper is 21 meters above the water at the top of the lighthouse. The keeper observes that there is a 2° angle of depression between the horizontal and the line of sight to a ship. How far is the ship from the base of the lighthouse? Include a sketch with your answer.
3. The vertex of a cone is cutoff to form a tapered shaft. The shaft is 22 centimeters long and has a diameter of 5 centimeters at the smaller end. If the angle of slant for the cone is 4° , what is the diameter of the larger end? Make a sketch.

Hint: This problem requires 2 calculations!

4. Use the two triangles below to determine which angle measure satisfies each equation.



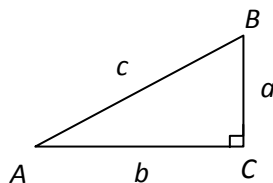
- a) $\tan x = 1$
- b) $\cos x = \frac{1}{2}$
- c) $\sin x = \cos x$
- d) $\sin x = \frac{1}{2}$
- e) $\tan x = \frac{\sqrt{3}}{3}$
- f) $\cos x = \frac{\sqrt{2}}{2}$

Solutions for Self-Check 22

Right Triangle Trig

1. Solve for the missing parts of right triangle ABC given that side a measures 3 cm, side c measures 7 cm, and angle C is the right angle. Draw and label the triangle. Round all calculations to 2 decimal places.

- Using the Pythagorean theorem, side $b = \sqrt{40}$ or $2\sqrt{10}$ or approximately 6.32 cm.
- Using the inverse sine function, angle A measures 25.38° . (See guy-wire problem in this video for calculator directions for finding an inverse function.)
- Measure of angle B is 64.62° .



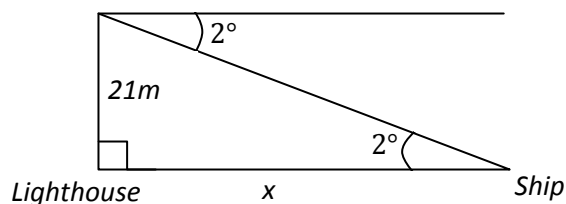
2. A lighthouse keeper is 21 meters above the water at the top of the lighthouse. The keeper observes that there is a 2° angle of depression between the horizontal and the line of sight to a ship. How far is the ship from the base of the lighthouse? Include a sketch with your answer.

Let x represent the distance from the shore to the ship.

$$\tan 2^\circ = \frac{21}{x}$$

$$x = \frac{21}{\tan 2^\circ}$$

$$x \approx 601.36 \text{ meters}$$



Solutions for Self-Check 22 Right Triangle Trig

3. The vertex of a cone is cutoff to form a tapered shaft. The shaft is 22 centimeters long and has a diameter of 5 centimeters at the smaller end. If the angle of slant for the cone is 4° , what is the diameter of the larger end? Make a sketch.

Hint: This problem requires 2 calculations!

Step 1: Find the distance x from the vertex of the cone to the smaller end of the shaft.

$$\tan 4^\circ = \frac{2.5}{x}$$

$$x \tan 4^\circ = 2.5$$

$$x = \frac{2.5}{\tan 4^\circ}$$

$$x \approx 35.75 \text{ cm}$$

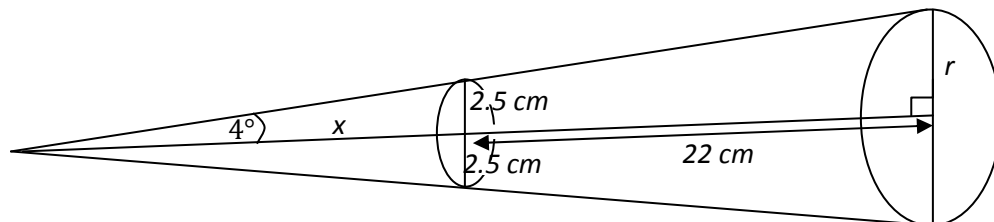
Step 2: Add 35.75 cm and 22 cm to find the length of the cone. Find for the diameter of the larger end of the shaft.

$$\tan 4^\circ \approx \frac{r}{57.75}$$

$$57.75 \tan 4^\circ \approx r$$

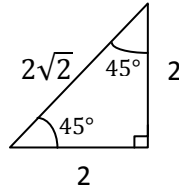
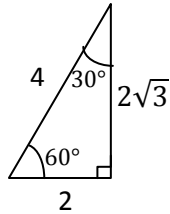
$$4.03827339 \approx r$$

The diameter of the larger end is approximately 8 cm.



Solutions for Self-Check 22 Right Triangle Trig

4. Use the two right triangles below to determine which angle satisfies each equation.



- a) $\tan x = 1$ $x = 45^\circ$
- b) $\cos x = \frac{1}{2}$ $x = 60^\circ$
- c) $\sin x = \cos x$ $x = 45^\circ$
- d) $\sin x = \frac{1}{2}$ $x = 30^\circ$
- e) $\tan x = \frac{\sqrt{3}}{3}$ $x = 30^\circ$
- f) $\cos x = \frac{\sqrt{2}}{2}$ $x = 45^\circ$