

# Trigonometry: Finding an Angle

Use SOH CAH TOA and the diagram to find the missing angle.



Name \_\_\_\_\_

Date \_\_\_\_\_

## Show your method

Label the hypotenuse, opposite, and adjacent sides relative to the unknown angle. Choose sin, cos, or tan, substitute the two known sides, then use the inverse trig function to solve for  $x$ . Round to 1 decimal place if needed.

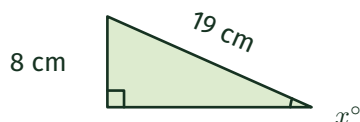
**Worked example** Find the missing angle  $x$  in a right-angled triangle with an opposite side of 7 cm and a hypotenuse of 14 cm.



$$\begin{aligned}\text{Using } \sin(x) &= \frac{O}{H}: \\ \sin(x) &= 7 \div 14 \\ \sin(x) &= 0.5 \\ x &= \sin^{-1}(0.5) = 30^\circ\end{aligned}$$

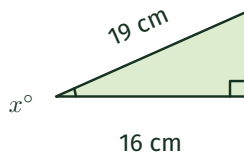
1. Find the size of angle  $x$ .

**Solution:**  $x = \sin^{-1}(8/19) \approx 24.9^\circ$



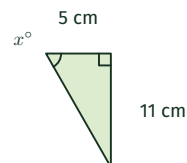
2. Find the size of angle  $x$ .

**Solution:**  $x = \cos^{-1}(16/19) \approx 32.6^\circ$



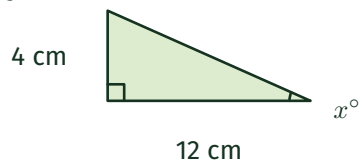
3. Find the size of angle  $x$ .

**Solution:**  $x = \tan^{-1}(11/5) \approx 65.6^\circ$



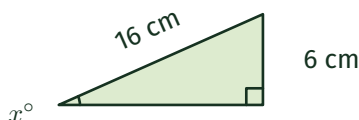
4. Find the size of angle  $x$ .

**Solution:**  $x = \tan^{-1}(4/12) \approx 18.4^\circ$



5. Find the size of angle  $x$ .

**Solution:**  $x = \sin^{-1}(6/16) \approx 22.0^\circ$



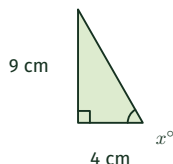
6. Find the size of angle  $x$ .

**Solution:**  $x = \cos^{-1}(6/14) \approx 64.6^\circ$



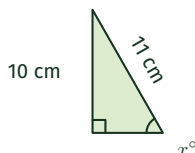
7. Find the size of angle  $x$ .

**Solution:**  $x = \tan^{-1}(9/4) \approx 66.0^\circ$



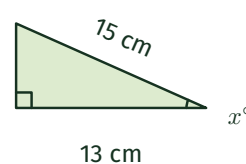
8. Find the size of angle  $x$ .

**Solution:**  $x = \sin^{-1}(10/11) \approx 65.4^\circ$



9. Find the size of angle  $x$ .

**Solution:**  $x = \cos^{-1}(13/15) \approx 29.9^\circ$



# Trigonometry: Finding an Angle (continued)

Solutions for finding a missing angle in various contexts.

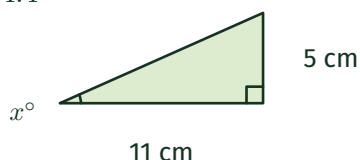


Name \_\_\_\_\_

Date \_\_\_\_\_

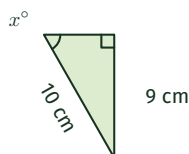
**10.** Find the size of angle  $x$ .

**Solution:**  $x = \tan^{-1}(5/11) \approx 24.4^\circ$



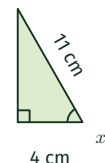
**11.** Find the size of angle  $x$ .

**Solution:**  $x = \sin^{-1}(9/10) \approx 64.2^\circ$



**12.** Find the size of angle  $x$ .

**Solution:**  $x = \cos^{-1}(4/11) \approx 68.7^\circ$



**13.** Ladder 5 m, foot 2 m from wall.

**Solution:**  $\cos^{-1}(2/5) \approx 66.4^\circ$

**14.** Ramp rise 2 m, run 8 m.

**Solution:**  $\tan^{-1}(2/8) \approx 14.0^\circ$

**15.** Pole 8 m, wire meets ground 5 m out.

**Solution:**  $\tan^{-1}(8/5) \approx 58.0^\circ$

**16.** Kite string 30 m, height 18 m.

**Solution:**  $\sin^{-1}(18/30) \approx 36.9^\circ$

**17.** Tower 20 m, shadow 12 m.

**Solution:**  $\tan^{-1}(20/12) \approx 59.0^\circ$

**18.** Zip-line: gap 22 m, drop 9 m.

**Solution:**  $\tan^{-1}(9/22) \approx 22.2^\circ$