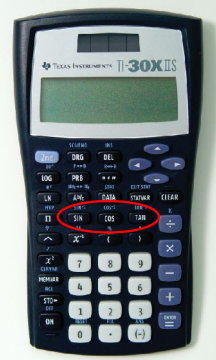


# Trigonometric Ratios

Trigonometric ratio—a ratio of the lengths of two sides of a right triangle

- Sine—abbreviated as *sin*.
- Cosine—abbreviated as *cos*.
- Tangent—abbreviated as *tan*.

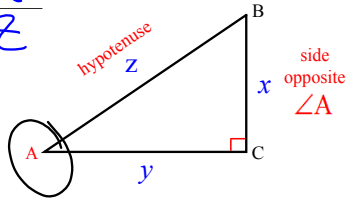


title

trig ratios

$$\text{sine } \theta = \frac{\text{side opposite the angle}}{\text{hypotenuse}}$$

$$\sin \angle A = \frac{x}{z}$$

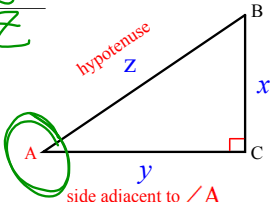


sine

$$\text{cosine } \theta = \frac{\text{side adjacent to the angle}}{\text{hypotenuse}}$$

*adjacent = next to or connected*

$$\cos \angle A = \frac{y}{z}$$



cosine

tangent  $\theta = \frac{\text{side opposite the angle}}{\text{side adjacent to the angle}}$

$\tan \angle A = \frac{x}{y}$

tangent

Some ways to remember the different trig ratios:

**SOHCAHTOA**  
Sine: Opposite/Hypotenuse    Cosine: Adjacent/Hypotenuse    Tangent: Opposite/Adjacent

or

Some Old Hippie  
 Caught Another Hippie  
 Tripping On Acid

sohcahtoa

Use the diagram shown to find the trigonometric ratio.

$\sin \angle D = \frac{8}{17}$   
 $\cos \angle D = \frac{15}{17}$   
 $\tan \angle D = \frac{8}{15}$   
 $\sin \angle F = \frac{15}{17}$   
 $\cos \angle F = \frac{8}{17}$   
 $\tan \angle F = \frac{15}{8}$

examples

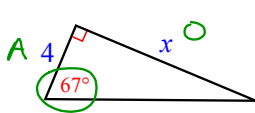
Use trig ratios to find side lengths of a right triangle given one side length and one acute angle:

Steps:

1. Label the sides using the given reference angle as hypotenuse, opposite, and adjacent.
2. Determine which trig ratio should be used.
3. Set up your equation.
4. Solve for x.
5. Use a calculator to find the decimal approximation.

steps

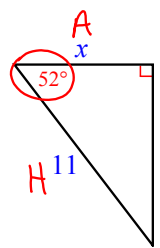
Find the value of  $x$ . Round to the nearest hundredth.



$4 \tan 67^\circ = \frac{x}{4}$   
 $9.42 = x$

examples

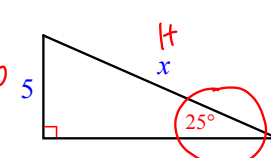
Find the value of  $x$ . Round to the nearest hundredth.



$11 \cos 52^\circ = \frac{x}{11}$   
 $x \approx 6.77$

examples

Find the value of  $x$ . Round to the nearest hundredth.



$x \sin 25^\circ = \frac{5}{x}$   
 $\frac{x \sin 25^\circ}{\sin 25^\circ} = \frac{5}{\sin 25^\circ}$   
 $x \approx 11.83$

examples

Conclusion

- How are the sides of a right triangle related? **SOHCAHTOA**
- How do we solve for a side of a triangle? **Use Trig.**
- Questions?

Nov 16-3:15 PM

**Assignment**  
**Trig Ratio Wkst #1**

Nov 16-3:16 PM