Warm Up

Write each fraction as a decimal rounded to the nearest hundredth.

1. $\frac{2}{3}$ 0.67

2. $\frac{7}{24}$ 0.29

Solve each equation.

3. $0.8 = \frac{5.8}{x}$ $x = 7.25$

4. $0.94 = \frac{x}{8.5}$ $x = 7.99$

Objectives

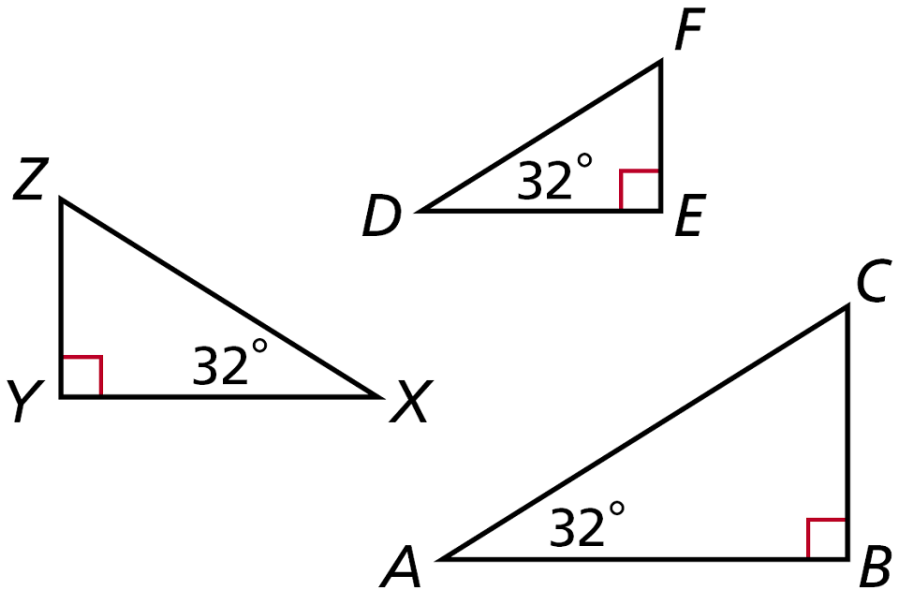
Find the sine, cosine, and tangent of an acute angle.

Use trigonometric ratios to find side lengths in right triangles and to solve real-world problems.

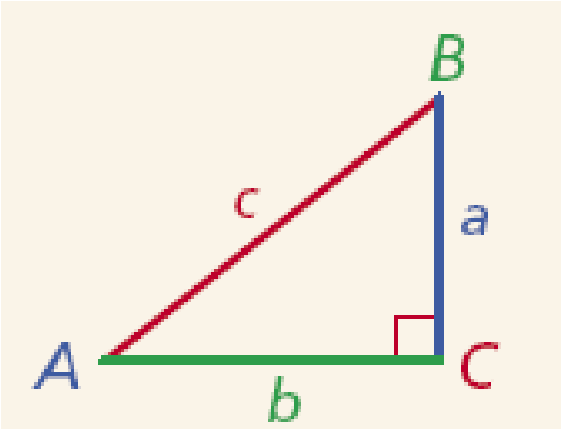
What does SOH-CAH-TOA stand for? Give every letter in the acronym.

8-2 Trigonometric Ratios

A **trigonometric ratio** is a ratio of two sides of a right triangle.

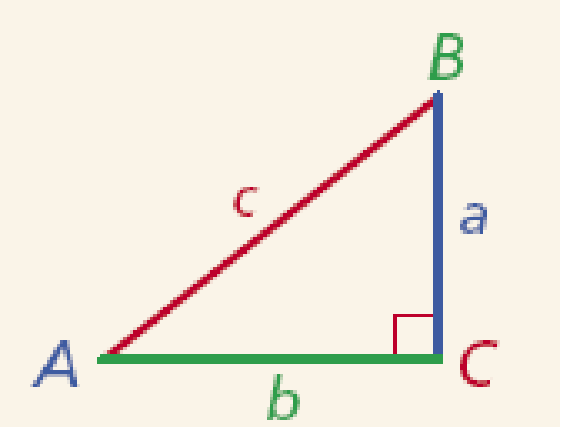


8-2 Trigonometric Ratios

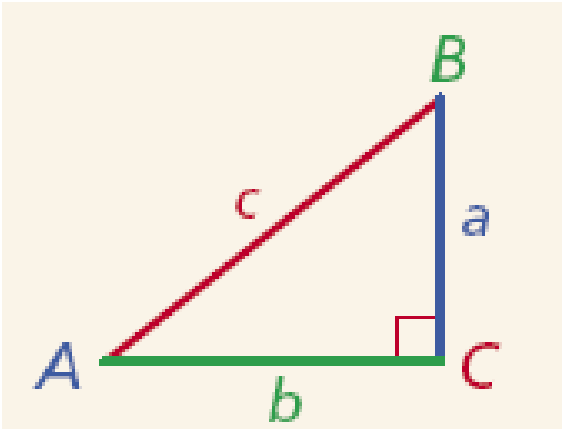


SINE	COSINE	TANGENT

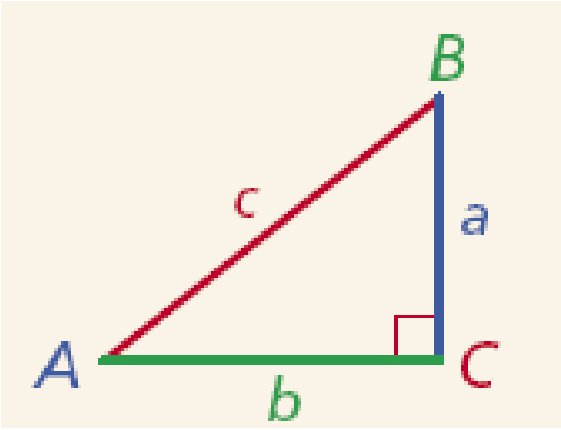
$$\sin = \frac{opposite}{hypotenuse}$$



$$\cos = \frac{adjacent}{hypotenuse}$$



$$\tan = \frac{opposite}{adjacent}$$



SOH – CAH – TOA

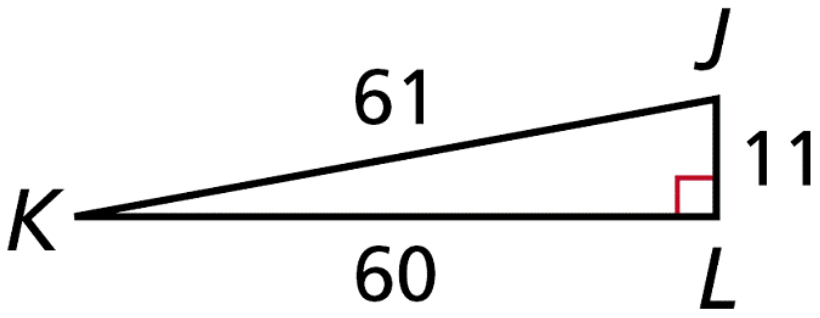
H refers to the Hypotenuse while O and A refer to the Legs. Remember, each triangle will have a Hypotenuse (the longest side) and two Legs (the shorter sides)

Writing Math

In trigonometry, the letter of the vertex of the angle is often used to represent the measure of that angle. For example, the sine of $\angle A$ is written as sin A.

Example 1A: Finding Trigonometric Ratios

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



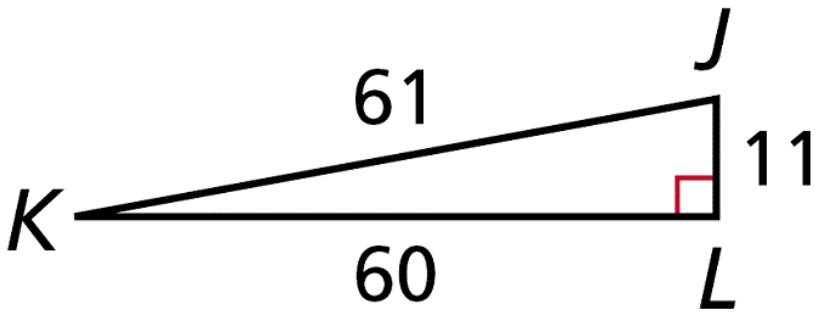
sin *J*

$$\sin J = \frac{60}{61} \approx 0.98$$

The sine of an ∠ is $\frac{\text{opp. leg}}{\text{hyp.}}$.

Example 1B: Finding Trigonometric Ratios

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



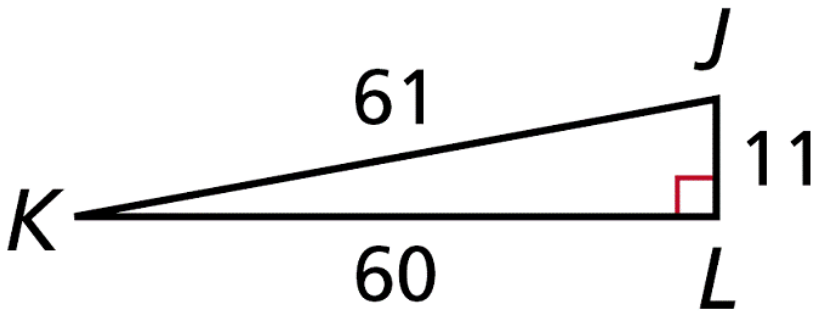
cos *J*

$$\cos J = \frac{11}{61} \approx 0.18$$

The cosine of an ∠ is $\frac{\text{adj. leg}}{\text{hyp.}}$.

Example 1C: Finding Trigonometric Ratios

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



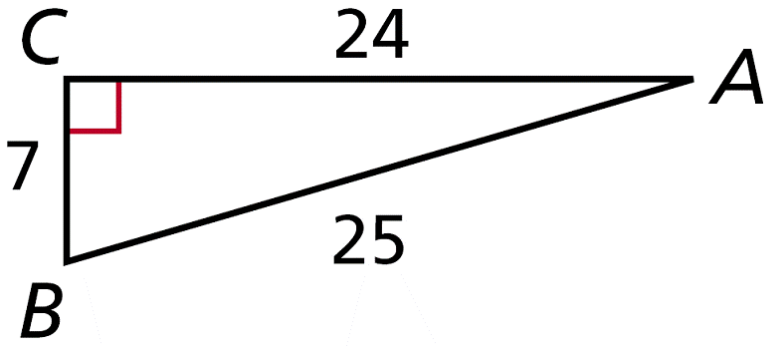
tan *K*

$$\tan K = \frac{11}{60} \approx 0.18$$

The tangent of an ∠ is $\frac{\text{opp. leg}}{\text{adj. leg}}$.

Check It Out! Example 1a

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



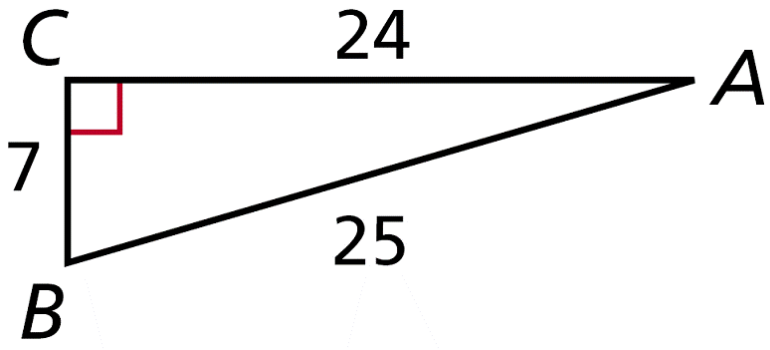
cos *A*

$$\cos A = \frac{24}{25} \approx 0.96$$

The cosine of an ∠ is $\frac{\text{adj. leg}}{\text{hyp.}}$.

Check It Out! Example 1b

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



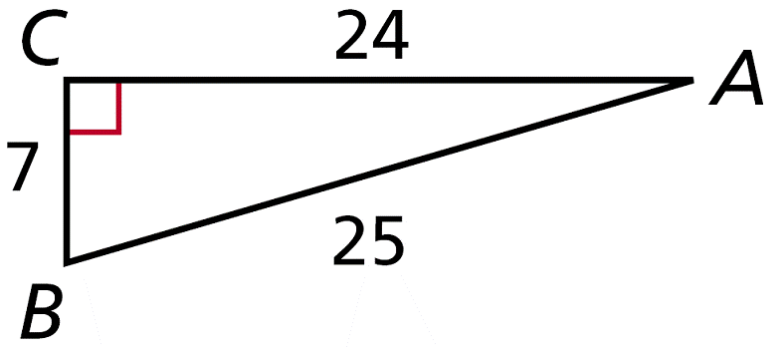
tan *B*

$$\tan B = \frac{24}{7} \approx 3.43$$

The tangent of an ∠ is $\frac{\text{opp. leg}}{\text{adj. leg}}$.

Check It Out! Example 1c

Write the trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



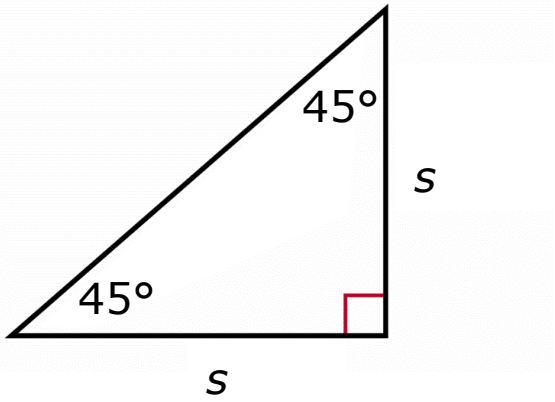
sin *B*

$$\sin B = \frac{24}{25} \approx 0.96$$

The sine of an ∠ is $\frac{\text{opp. leg}}{\text{hyp.}}$.

Check It Out! Example 2

Use a special right triangle to write tan 45° as a fraction.



Draw and label a 45º-45º-90º Δ.

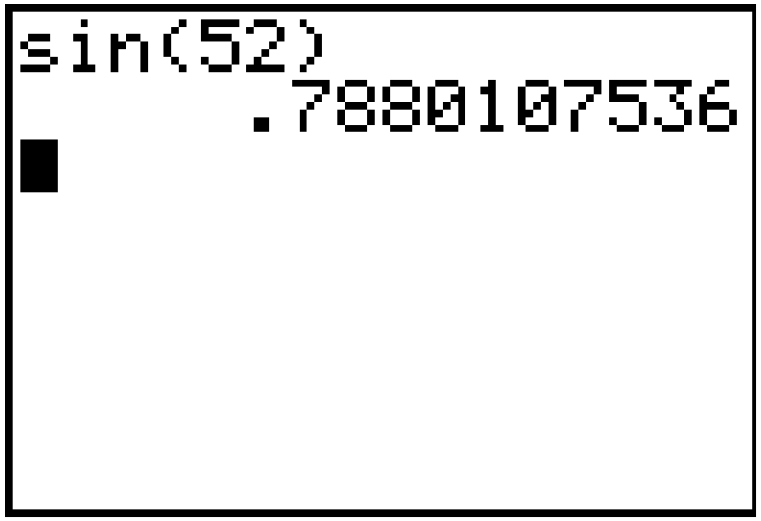
$$\tan 45^\circ = \frac{s}{s} = 1$$

The tangent of an ∠ is $\frac{\text{opp. leg}}{\text{adj. leg}}$.

Example 3A: Calculating Trigonometric Ratios

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

sin 52°



sin 52° ≈ 0.79

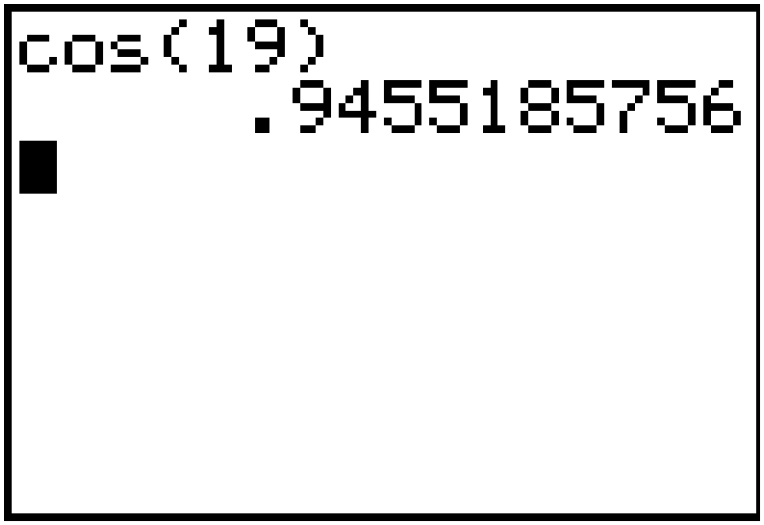
Caution!

Be sure your calculator is in degree mode, not radian mode.

Example 3B: Calculating Trigonometric Ratios

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

cos 19°

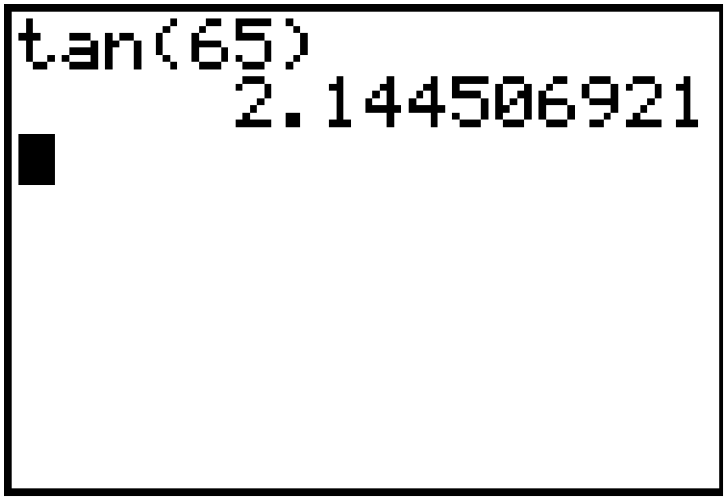


cos 19° ≈ 0.95

Example 3C: Calculating Trigonometric Ratios

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

tan 65°

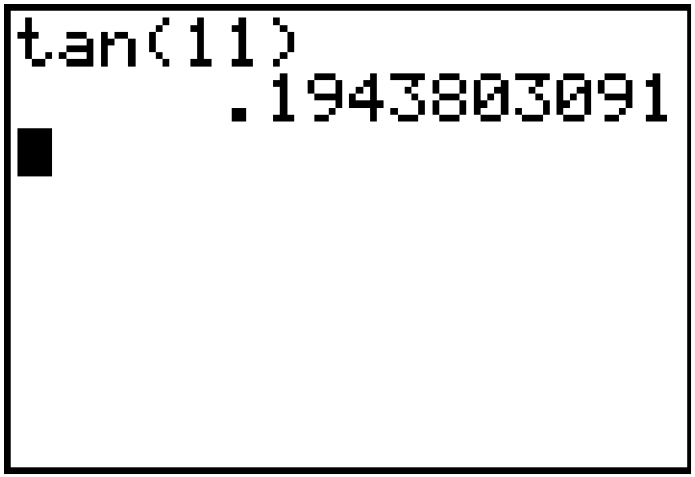


tan 65° ≈ 2.14

Check It Out! Example 3a

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

tan 11°

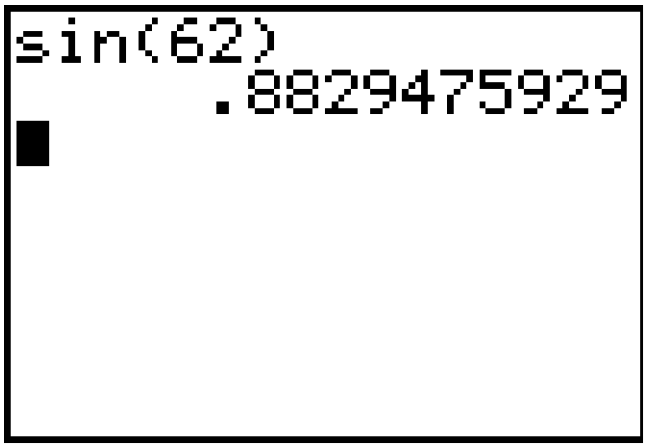


tan 11° ≈ 0.19

Check It Out! Example 3b

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

sin 62°

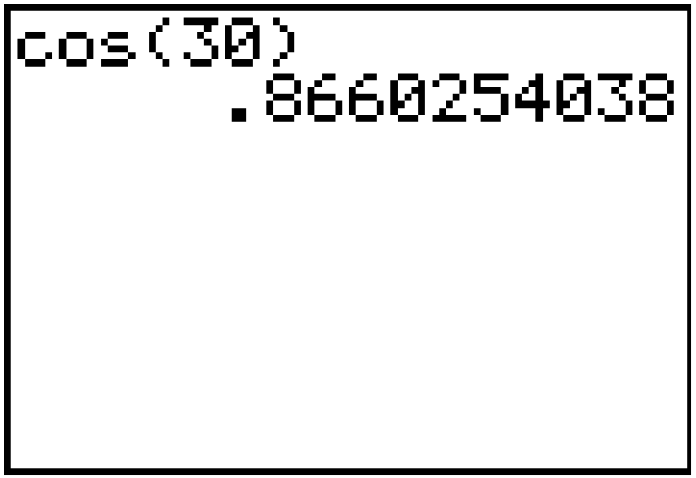


$\sin 62° \approx 0.88$

Check It Out! Example 3c

Use your calculator to find the trigonometric ratio. Round to the nearest hundredth.

cos 30°



cos 30° ≈ 0.87

HOMEWORK

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