9.5 sin and cos ratios

Tuesday, March 28, 2017 10:16 AM

What You Will Learn

- Use the sine and cosine ratios.
- Find the sine and cosine of angle measures in special right triangles.
- Solve real-life problems involving sine and cosine ratios.

- Proper labeling of a Triangle

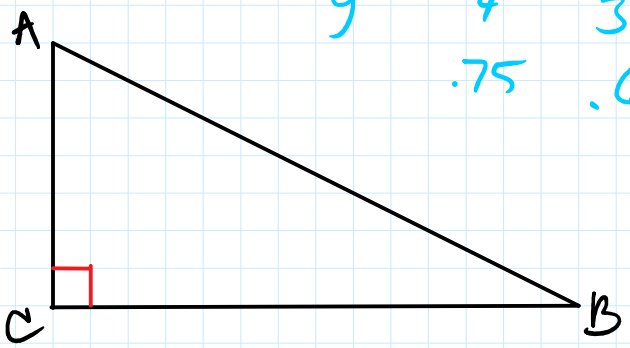
Using the Sine and Cosine Ratios

The **sine** and **cosine** ratios are trigonometric ratios for acute angles that involve the lengths of a leg and the hypotenuse of a right triangle.

$\frac{x}{y}$ $\frac{3}{4}$ $\frac{2}{3}$

.75 .6667

Labeling a Triangle:



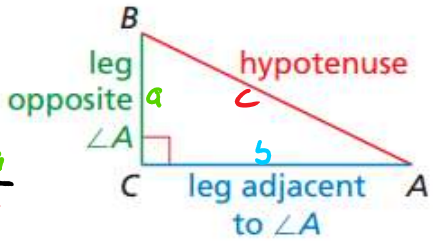
Sine and Cosine Ratios

sin Sine Opposite Hypotenuse

Let $\triangle ABC$ be a right triangle with acute $\angle A$.

Sine and Cosine Ratios

Let $\triangle ABC$ be a right triangle with acute $\angle A$. The sine of $\angle A$ and cosine of $\angle A$ (written as sin A and cos A) are defined as follows.



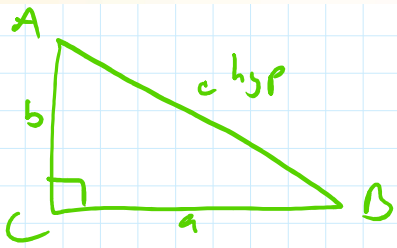
$$\sin A = \frac{\text{length of leg opposite } \angle A}{\text{length of hypotenuse}} = \frac{BC}{AB} = \frac{a}{c}$$

$$\cos A = \frac{\text{length of leg adjacent to } \angle A}{\text{length of hypotenuse}} = \frac{AC}{AB} = \frac{b}{c}$$

Opposite
Hypotenuse

cos

Cosine
Adjacent
Hypotenuse



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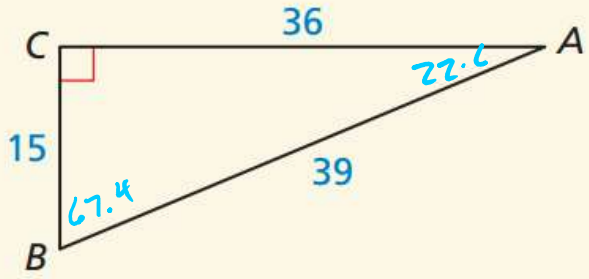
tan

Tangent
Opposite
Adjacent

Find sin A, sin B, cos A, and cos B. Write each answer as a fraction and as a decimal rounded to four places.



.3841

SOH - CAH - TOA

$\sin A = \frac{opp}{hyp} = \frac{15}{39} = .3846$

$\cos A = \frac{adj}{hyp} = \frac{36}{39} = .9231$

$\sin B = \frac{opp}{hyp} = \frac{36}{39} = .9231$

$\cos B = \frac{adj}{hyp} = \frac{15}{39} = .3846$

Sine and Cosine of Complementary Angles

The sine of an acute angle is equal to the cosine of its complement. The cosine of an acute angle is equal to the sine of its complement.

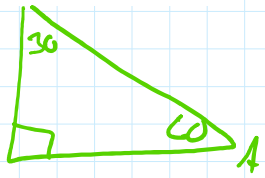
Let A and B be complementary angles. Then the following statements are true.

$\sin A = \cos(90° - A) = \cos B$ $\quad$ $\sin B = \cos(90° - B) = \cos A$

$\cos A = \sin(90° - A) = \sin B$ $\quad$ $\cos B = \sin(90° - B) = \sin A$

sin of ∠ = cos of it's complement

cos of ∠ = sin of it's complement



Write cos 69° in terms of sine.

Cos 69° = Sin 21°

.3584 .3584

Write sin 56° in terms of cosine.

Sin 56 = cos 34

.8290 .8290

Find the values of x and y using sine and cosine. Round your answers to the nearest tenth.

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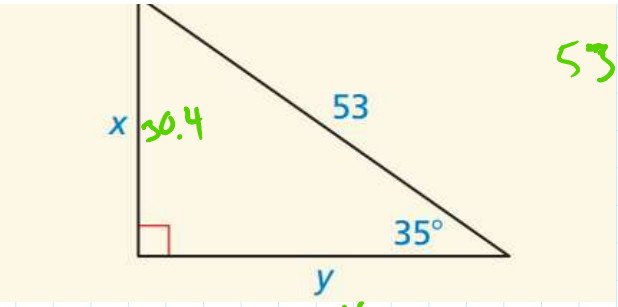
$\sin 35° = \frac{x}{53}$

$53(.5736) = \left(\frac{x}{53}\right)53$



$53(.5736) = \left(\frac{x}{53}\right)53$

$30.4 = x$

$\cos 35° = \frac{y}{53}$

$53(.8192) = \left(\frac{y}{53}\right)53$

$43.4 = y$

Find the values of x and y using sine and cosine.
Round your answers to the nearest tenth.

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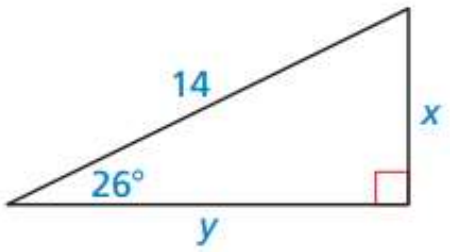


$\sin 26 = \frac{x}{14}$

$.4384 = \frac{x}{14}$

$6.1 = x$

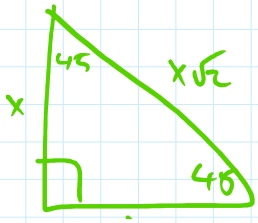
$\cos 26 = \frac{y}{14}$

$.8988 = \frac{y}{14}$

$12.6 = y$

Find the sine and cosine of a 45° angle.

$.7071 = \frac{\sqrt{2}}{2}$



x

Find the sine and cosine of a 30° angle.

sin 30 = .5

cos 30 = .8660

Find the sine and cosine of a 60° angle.

sin 60 = .8660

cos 60 = .5

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Practice sec 9.5 pg.
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