Inverse Trig Functions

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Inverse Trig Functions

If we know the lengths of two sides of a right triangle, we can use **inverse trig functions** to find the angles.

"arcsin(some number)" is equal to the angle whose sine is (some number).

arcsin is often written as $\sin^{-1}$
When given a trig function value, we use a calculator to find the angle measure. Use the 2nd and SIN keys to calculate $\sin^{-1}$.

Use inverse trig functions when you need to find the angle.

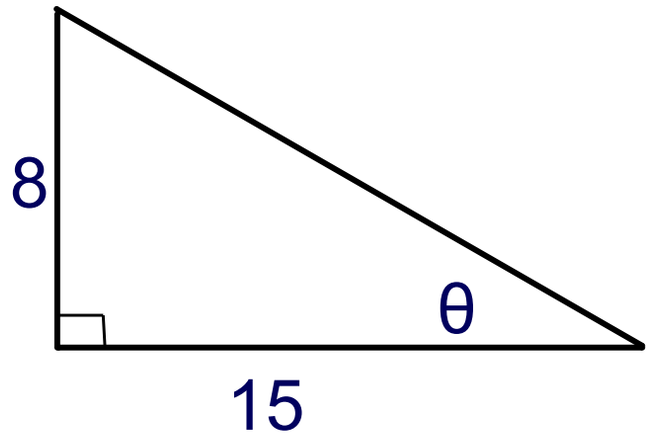
Inverse Trig Functions

Note: In the next unit we will explore the values of trig functions for any angle. At that point, it will be clear that because the sin, cos and tan functions repeat (they are not one-to-one), their inverses are not functions. If we restrict the domain, however, the functions are one-to-one and their inverses are functions.

When the inverse function is entered into the calculator, the response is a number in the restricted interval.

Inverse Trig Functions

Example: In this triangle, $\tan\theta = \frac{8}{15}$.



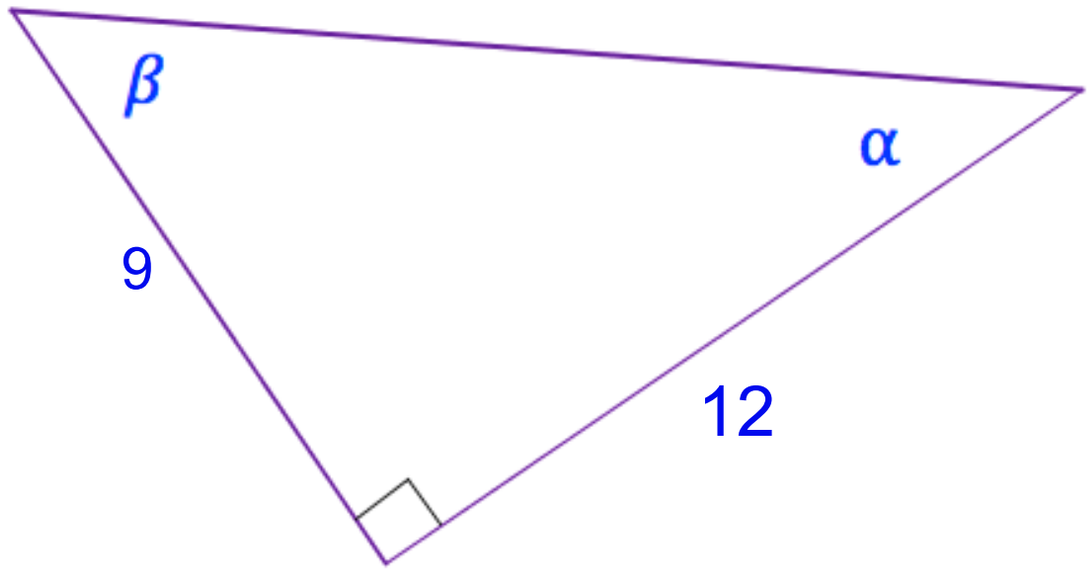
We are looking for the angle whose tangent is $\frac{8}{15}$.

$\tan^{-1}(\frac{8}{15}) \approx 28.1°$

(Enter " 2nd TAN (8 ÷ 15)" into the calculator.)

Inverse Trig Functions

Find the value of the angles and other side of the triangle.



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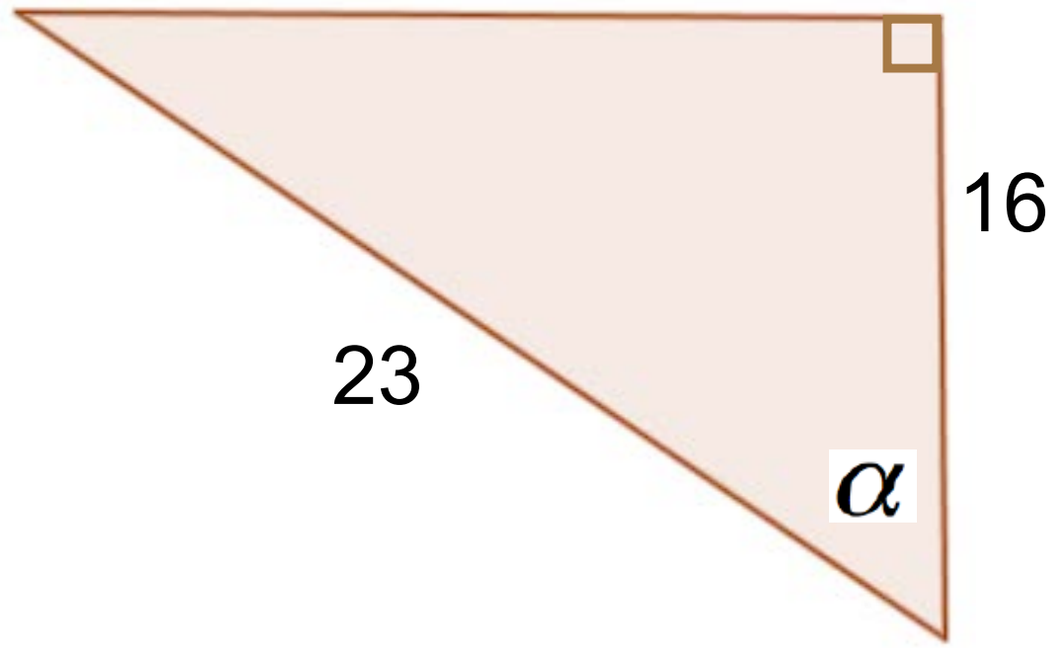
1) Use the Pythagorean Theorem to find third side. (don't forget to think about Pythagorean triples)

2) Use any inverse trig function to find one of the angles.

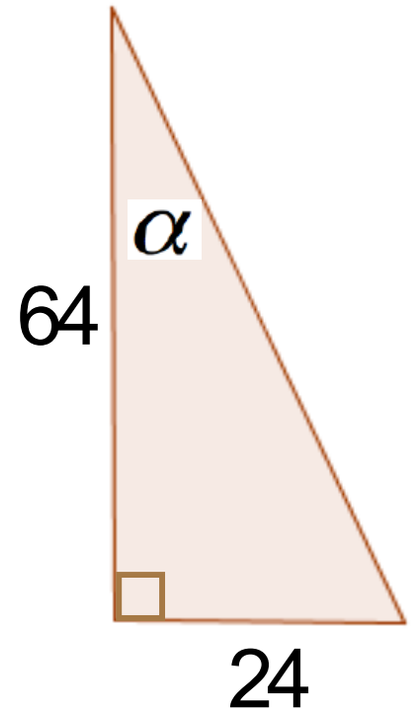
3) Subtract that angle measure from 90° to find the other angle.

15 Find the value of the angle indicated.



Answer

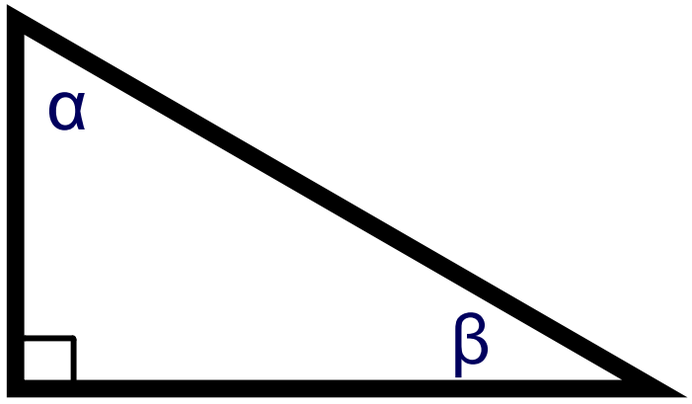
16 Find the value of the angle indicated.



Answer

Sin and Cos

What is the relationship between the sine of the measure of an acute angle of a right triangle and the cosine of the other acute angle?



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