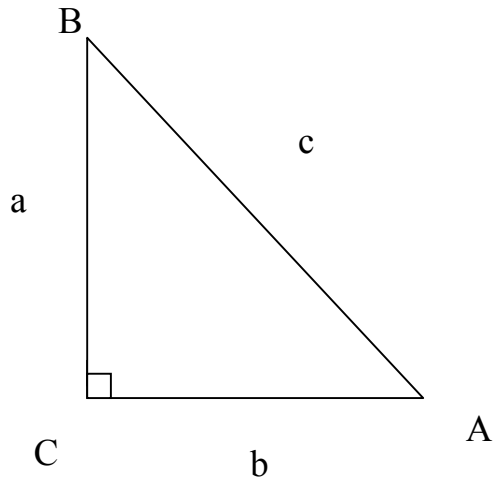
Section 7.1 Solving Right Triangles

Use Pythagorean Theorem and triangle definitions to find measure of missing sides in a right triangle.



$a^2 + b^2 = c^2$

$\sin A = a/c$
$\cos A = b/c$
$\tan A = a/b$

$\sin B = b/c$
$\cos B = a/c$
$\tan B = b/a$

Example 1 Given right triangle ABC w/hypotenuse c, if a = 5, b = 4, find c.

Example 2 A right triangle has an 8 inch hypotenuse. If one angle is 30°, find the length of each leg.

a) 8cos 30°, 8sin 30°
b) 8/cos 30°, 8/sin 30°
c) cos 30°/8, sin 30°/8
d) 8/cos 60°, 8/sin 60°

NOTE: $\alpha = A$
$\beta = B$
$\gamma = C$

Example 3 In the right triangle ABC, if hypotenuse c = 1 and b = x, then (cosα)(cotβ) =

$a)\sqrt{1-x^2}$

$b)\sqrt{1+x^2}$

$c)\dfrac{x^2}{\sqrt{1-x^2}}$

$d)\dfrac{1}{\sqrt{1-x^2}}$

e) None of these

Example 4 A right triangle contains an angle of π/8 radians. If one leg is 3 meters, what is the length of the hypotenuse? (Hint: Two answers are possible.)

a) 3cos (π/8), 3sin (π/8)
b) 3/cos (π/8), 3/sin (π/8)
c) cos (π/8)/3, sin (π/8)/3
d) 3cos (3π/8), 3sin (3π/8)