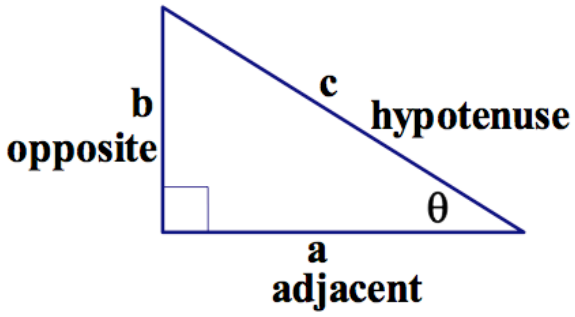
Evaluating Trig Functions Given a Point and Trig Functions of Quadrantal Angles



The terms sine, cosine, tangent, secant, cosecant, and cotangent are the names given to each of the combinations of the ratios of the sides.

Use SOH-CAH-TOA to determine the 6 trig ratios.

Scale document up

sin θ = **csc θ =**

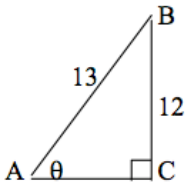
cos θ = **sec θ =**

tan θ = **cot θ =**

Notice the reciprocal relationships:

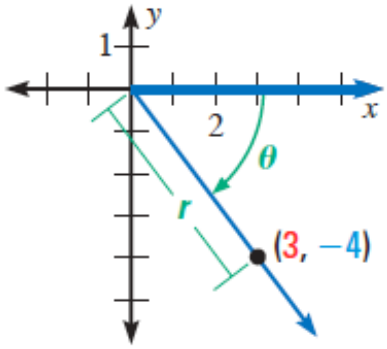
$$\csc\theta = \frac{1}{\sin\theta} \qquad \sec\theta = \frac{1}{\cos\theta} \qquad \cot\theta = \frac{1}{\tan\theta}$$

***Example 1*:** Use the triangle to find the ratios of all six trig functions.



Evaluating Trigonometric Functions Given a Point

Example 1: Let (3,-4) be a point on the **terminal side** of an angle θ in standard position. Evaluate the **six trigonometric functions** of θ.

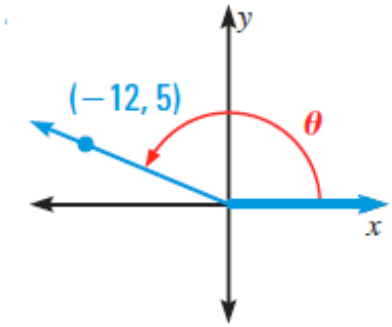


sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

Example 2: Let (-12,5) be a point on the **terminal side** of an angle θ in standard position. Evaluate the **six trigonometric functions** of θ.

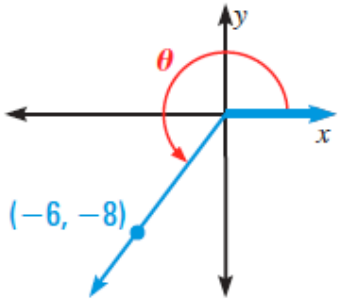


sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

Example 3: Let (-6,-8) be a point on the **terminal side** of an angle θ in standard position. Evaluate the **six trigonometric functions** of θ.

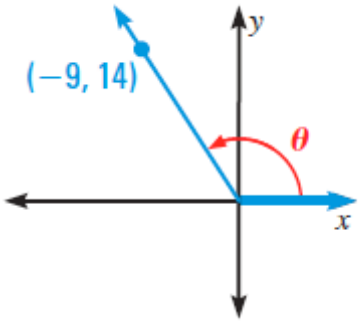


sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

Example 4: Let (-2,3) be a point on the **terminal side** of an angle θ in standard position. Evaluate the **six trigonometric functions** of θ.



sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

Practice: Use the given point on the terminal side of an angle θ in standard position. Evaluate the six trigonometric functions of θ.

1.) (-3,-2)

sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

2.) (-1,1)

sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

3.) (15,-8)

sin θ= csc θ=

cos θ= sec θ=

tan θ= cot θ=

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4.) (3,-1)

$\sin\theta=$ $\csc\theta=$

$\cos\theta=$ $\sec\theta=$

$\tan\theta=$ $\cot\theta=$

5.) (7,10)

$\sin\theta=$ $\csc\theta=$

$\cos\theta=$ $\sec\theta=$

$\tan\theta=$ $\cot\theta=$

6.) $(1,-\sqrt{3})$

$\sin\theta=$ $\csc\theta=$

$\cos\theta=$ $\sec\theta=$

$\tan\theta=$ $\cot\theta=$

7.) $(-15,5\sqrt{7})$

$\sin\theta=$ $\csc\theta=$

$\cos\theta=$ $\sec\theta=$

$\tan\theta=$ $\cot\theta=$