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Unit 6 (Chapter 5): Analytic Trigonometry **Pre-Calculus 2016-2017**

5.1 Fundamental Trig Identities

Target 6A: Verify, evaluate, and apply trigonometric identities and formulas

Review of Prior Concepts

If $\sin\theta = 0.57$, then $\sin(\pi - \theta) = ?$

Reciprocal Identities

$\sin\theta = \frac{1}{\quad}$ $\quad \csc\theta = \frac{1}{\quad}$

$\cos\theta = \frac{1}{\quad}$ $\quad \sec\theta = \frac{1}{\quad}$

$\tan\theta = \frac{1}{\quad}$ $\quad \cot\theta = \frac{1}{\quad}$

Quotient Identities

$\tan\theta = \frac{\quad}{\quad}$

$\cot\theta = \frac{\quad}{\quad}$

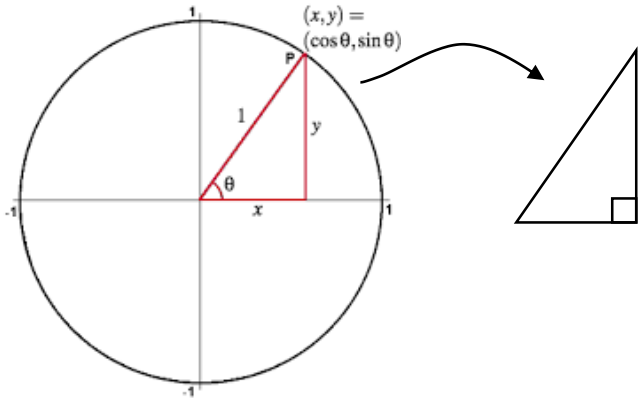
Examples

Simplify.

a) $\cot x \tan x$

b) $\frac{\sin b}{\tan b}$

Pythagorean Identities



Examples

a) Use Pythagorean Identities to find $\sec\theta$ and $\csc\theta$ if $\tan\theta = 3$ and $\cos\theta > 0$.

b) Simplify $\frac{\sin^2\alpha+\tan^2\alpha+\cos^2\alpha}{\sec\alpha}$

Cofunction Identities

$$\sin\left(\frac{\pi}{2}-\theta\right)=\cos\theta \qquad \cos\left(\frac{\pi}{2}-\theta\right)=\sin\theta$$

$$\tan\left(\frac{\pi}{2}-\theta\right)=\cot\theta \qquad \cot\left(\frac{\pi}{2}-\theta\right)=\tan\theta$$

$$\sec\left(\frac{\pi}{2}-\theta\right)=\csc\theta \qquad \csc\left(\frac{\pi}{2}-\theta\right)=\sec\theta$$

Odd-Even Identities

$$\sin(-x)=-\sin x \qquad \csc(-x)=-\csc x$$

$$\cos(-x)=\cos x \qquad \sec(-x)=\sec x$$

$$\tan(-x)=-\tan x \qquad \cot(-x)=-\cot x$$

Examples

a) If $\tan\left(\frac{\pi}{2}-\theta\right)=-5.326$, find $\cot\theta$.

b) Simplify $\sec(-x)\cos(-x)$

More Practice

Fundamental Trig Identities

http://www.intmath.com/analytic-trigonometry/1-trigonometric-identities.php
http://www.mathguide.com/lessons2/TrigExpress.html
http://www.purplemath.com/modules/proving.htm
https://www.youtube.com/watch?v=CsfHFZL345M
https://www.youtube.com/watch?v=I4mcja8abDc

Homework Assignment

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