Precalculus

5-01 Fundamental Trigonometric Identities Part A

Uses for identities

- _____trig functions
- _____trig expressions
- Develop more _____
- _____trig equations

Reciprocal Identities

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

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

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

Quotient Identities

$\tan u = \frac{\sin u}{\cos u}$ $\quad \cot u = \frac{\cos u}{\sin u}$

Pythagorean Identities

$\sin^2 u + \cos^2 u = 1$ $\quad \tan^2 u + 1 = \sec^2 u$

$1 + \cot^2 u = \csc^2 u$

Even/Odd Identities

$\cos(-u) = \cos u$ $\quad \sec(-u) = \sec u$

$\sin(-u) = -\sin u$ $\quad \tan(-u) = -\tan u$

$\csc(-u) = -\csc u$ $\quad \cot(-u) = -\cot u$

Cofunction Identities

$\sin\left(\frac{\pi}{2} - u\right) = \cos u$ $\quad \cos\left(\frac{\pi}{2} - u\right) = \sin u$

$\tan\left(\frac{\pi}{2} - u\right) = \cot u$ $\quad \cot\left(\frac{\pi}{2} - u\right) = \tan u$

$\sec\left(\frac{\pi}{2} - u\right) = \csc u$ $\quad \csc\left(\frac{\pi}{2} - u\right) = \sec u$

If $\sin\theta = -1$ and $\cot\theta = 0$, evaluate $\cos\theta$

Evaluate $\tan\theta$

Simplify $\frac{\sec^2 x - 1}{\sin^2 x}$

Simplify $\sin\varphi\,(\csc\varphi - \sin\varphi)$

Simplify $\frac{1-\sin^2 x}{\csc^2 x-1}$

Simplify $\cos\left(\frac{\pi}{2} - x\right)(\sec x)$