

Algebra 2

10-07 Using Trigonometric Identities

Trigonometric Identity

- Statement showing relationship between two quantities that are always _____

Reciprocal Identities

$$\begin{aligned}\sin u &= \frac{1}{\csc u} & \csc u &= \frac{1}{\sin u} \\ \cos u &= \frac{1}{\sec u} & \sec u &= \frac{1}{\cos u} \\ \tan u &= \frac{1}{\cot u} & \cot u &= \frac{1}{\tan u}\end{aligned}$$

Quotient Identities

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

Pythagorean Identities

$$\begin{aligned}\sin^2 u + \cos^2 u &= 1 \\ \tan^2 u + 1 &= \sec^2 u \\ 1 + \cot^2 u &= \csc^2 u\end{aligned}$$

Even/Odd Identities

$$\begin{aligned}\cos(-u) &= \cos u & \sec(-u) &= \sec u \\ \sin(-u) &= -\sin u & \tan(-u) &= -\tan u \\ \csc(-u) &= -\csc u & \cot(-u) &= -\cot u\end{aligned}$$

Cofunction Identities

$$\begin{aligned}\sin\left(\frac{\pi}{2} - u\right) &= \cos u & \cot\left(\frac{\pi}{2} - u\right) &= \tan u \\ \cos\left(\frac{\pi}{2} - u\right) &= \sin u & \sec\left(\frac{\pi}{2} - u\right) &= \csc u \\ \tan\left(\frac{\pi}{2} - u\right) &= \cot u & \csc\left(\frac{\pi}{2} - u\right) &= \sec u\end{aligned}$$

Given that $\sin \theta = -\frac{5}{13}$ and $\pi < \theta < \frac{3\pi}{2}$, find the values of the other five trigonometric functions of θ .

Simplify $(1 + \cos \theta)(1 - \cos \theta)$

$\sin x \cot x$

Verify Trigonometric Identities

- Show that trig identities are true by turning _____ into the _____
- Guidelines
 1. Work with _____ at a time. Start with the more _____ side.
 2. Try _____, add _____, etc.
 3. Use _____
 4. If the above doesn't work, try rewriting in _____ and _____
 5. Try _____!

Verify $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x} = 1$

$\cos\left(\frac{\pi}{2} - x\right) \cot x = \cos x$

575 #1, 3, 5, 7, 9, 11, 14, 15, 17, 19, 21, 23, 25, 33, 35, 39, 41, 42, 45, 46 = 20