Basic Trigonometric Identities

Type Conversion and Even/Odd

$$\tan x = \frac{\sin x}{\cos x} \qquad \sin x = \frac{\tan x}{\sec x}$$

$$\sec x = \frac{1}{\cos x} \qquad \cos x = \frac{1}{\sec x}$$

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

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

Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1$$

Alternate Forms:

$$\sin^2 x = 1 - \cos^2 x$$

$$\cos^2 x = 1 - \sin^2 x$$

$$\tan^2 x + 1 = \sec^2 x$$

Alternate Forms:

$$\tan^2 x = \sec^2 x - 1$$

$$\sec^2 x = \tan^2 x + 1$$

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1. Suppose x is an angle in QI with $\sin(x) = \frac{3}{5}$

   $\cos(x) =$ $\tan(x) =$ $\sec(x) =$

2. Suppose x is an angle in QIII with $\tan(x) = \frac{5}{3}$

   $\sec(x) =$ $\cos(x) =$ $\sin(x) =$

3. Suppose x is an angle in QIV with $\sec(x) = \frac{3}{2}$

   $\tan(x) =$ $\cos(x) =$ $\sin(x) =$

4. Show that $\dfrac{1+\sin x}{1-\sin x} = \big(\sec x + \tan x\big)^2$

5. Simplify.

$$\frac{1}{\sin(t)\cos(t)} - \frac{1}{\tan(t)}$$

6. Write using only $\sin x$.

$f(x) = \sec x \ \tan x$

7. Write using only $\tan x$.

$f(x) = \sin^2 x$