# Reciprocal Identities

| | | |
|---|---|---|
| $\sin\theta = \dfrac{1}{\csc\theta}$ | $\cos\theta = \dfrac{1}{\sec\theta}$ | $\tan\theta = \dfrac{1}{\cot\theta}$ |
| $\csc\theta = \dfrac{1}{\sin\theta}$ | $\sec\theta = \dfrac{1}{\cos\theta}$ | $\cot\theta = \dfrac{1}{\tan\theta}$ |

# Quotient Identities

| | |
|---|---|
| $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$ | $\cot\theta = \dfrac{\cos\theta}{\sin\theta}$ |

# Pythagorean Identities

| | | |
|---|---|---|
| $\sin^2\theta + \cos^2\theta = 1$ | $\tan^2\theta + 1 = \sec^2\theta$ | $1 + \cot^2\theta = \csc^2\theta$ |

# Negative Angle Identities

| | | |
|---|---|---|
| $\sin(-\theta) = -\sin\theta$ | $\cos(-\theta) = \cos\theta$ | $\tan(-\theta) = -\tan\theta$ |
| $\csc(-\theta) = -\csc\theta$ | $\sec(-\theta) = \sec\theta$ | $\cot(-\theta) = -\cot\theta$ |

| | |
|---|---|
| $\frac{\cos x}{\sin x}$ | $\sin^2 x + \cos^2 x$ |
| $\tan x$ | $\cot x$ |
| $\cos(-x)$ | $\sec^2 x$ |
| $\tan^2 x + 1$ | $\frac{\sin x}{\cos x}$ |
| $1$ | $\cos x$ |

Source: Trigonometry (9th Edition) by Lial, Hornsby, Schneider Page 205 #33-37

| | |
|---|---|
| $-\tan x \cos x$ | $\dfrac{\sin^2 x}{\cos^2 x}$ |
| $\sec^2 x - 1$ | $\dfrac{1}{\sec^2 x}$ |
| $\dfrac{\sec x}{\csc x}$ | $\sin(-x)$ |
| $1 + \sin^2 x$ | $\csc^2 x - \cot^2 x + \sin^2 x$ |
| $\cos^2 x$ | $\tan x$ |

Source: Trigonometry (9th Edition) by Lial, Hornsby, Schneider Page 205 #38-42

| | |
|---|---|
| $\cot\theta\ \sin\theta$ | $1$ |
| $\sec\theta\cot\theta\sin\theta$ | $\cot\theta$ |
| $\cos\theta\csc\theta$ | $\cos\theta$ |
| $\cot^2\theta\,(1+\tan^2\theta)$ | $\cos^2\theta$ |
| $\sin^2\theta\,(\csc^2\theta-1)$ | $\csc^2\theta$ |

Source: Trigonometry ($9^{th}$ Edition) by Lial, Hornsby, Schneider Page 205 #53-57

| | |
|---|---|
| $(\sec\theta - 1)(\sec\theta + 1)$ | $\tan^2\theta$ |
| $(1 - \cos\theta)(1 + \sec\theta)$ | $\cot\theta - \tan\theta$ |
| $\dfrac{\cos\theta + \sin\theta}{\sin\theta}$ | $\sec\theta - \cos\theta$ |
| $\dfrac{\cos^2\theta - \sin^2\theta}{\sin\theta\cos\theta}$ | $\sin^2\theta\cos^2\theta$ |
| $\dfrac{1 - \sin^2\theta}{1 + \cot^2\theta}$ | $1 + \cot\theta$ |

Source: Trigonometry (9th Edition) by Lial, Hornsby, Schneider Page 205 #58-62

| | |
|---|---|
| $\sec\theta - \cos\theta$ | $\cot\theta - \tan\theta$ |
| $(\sec\theta + \csc\theta)(\cos\theta - \sin\theta)$ | $\cos^2\theta$ |
| $\sin\theta\,(\csc\theta - \sin\theta)$ | $\tan^2\theta$ |
| $\dfrac{1 + \tan^2\theta}{1 + \cot^2\theta}$ | $\sec^2\theta$ |
| $\sin^2\theta + \tan^2\theta + \cos^2\theta$ | $\tan\theta\sin\theta$ |

Source: Trigonometry (9th Edition) by Lial, Hornsby, Schneider Page 205 #63-67