TRIG IDENTITIES

Reciprocal Functions: $\csc x = \frac{1}{\sin x}; \sec x = \frac{1}{\cos x}; \ \cot x = \frac{1}{\tan x}$

Quotient Identities: $\tan x = \frac{\sin x}{\cos x}; \quad \cot x = \frac{\cos x}{\sin x}$

Even/Odd Functions: $\cos(-x) = \cos x; \quad \sin(-x) = -\sin x \qquad \tan(-x) = -\tan x$

Pythagorean Identities: $\sin^2 x + \cos^2 x = 1; \quad \cos^2 x = 1 - \sin^2 x; \quad \sin^2 x = 1 - \cos^2 x$

Transformation Identities: $\cos\left(x - \frac{\pi}{2}\right) = \sin x; \ \sin\left(x + \frac{\pi}{2}\right) = \cos x$

Co-function Identities: $\cos\left(\frac{\pi}{2} - x\right) = \sin x; \ \sin\left(\frac{\pi}{2} - x\right) = \cos x$

Compound Angle Formulas:

$\sin(x + y) = \sin x \cos y + \cos x \sin y; \qquad \sin(x - y) = \sin x \cos y - \cos x \sin y$

$\cos(x + y) = \cos x \cos y - \sin x \sin y; \qquad \cos(x - y) = \cos x \cos y + \sin x \sin y$

$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}; \qquad\qquad \tan(x - y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$

Double Angle Formulas:

$\sin(2x) = 2 \sin x \cos x$

$\cos(2x) = \cos^2 x - \sin^2 x; \quad \cos(2x) = 2 \cos^2 x - 1; \qquad \cos(2x) = 1 - 2 \sin^2 x$

$\tan(2x) = \frac{2 \tan x}{1 - \tan^2 x}$