

Trigonometry Identities

Quotient Identities

$$I1 \quad \tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$I2 \quad \cot \theta = \frac{\cos \theta}{\sin \theta}$$

Reciprocal Identities

$$I3 \quad \sin \theta = \frac{1}{\csc \theta}$$

$$I4 \quad \csc \theta = \frac{1}{\sin \theta}$$

$$I5 \quad \cos \theta = \frac{1}{\sec \theta}$$

$$I6 \quad \sec \theta = \frac{1}{\cos \theta}$$

$$I7 \quad \tan \theta = \frac{1}{\cot \theta}$$

$$I8 \quad \cot \theta = \frac{1}{\tan \theta}$$

Pythagorean Identities

$$I9 \quad \sin^2 \theta + \cos^2 \theta = 1$$

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

$$\csc^2 \theta - \cot^2 \theta = 1$$

$$I10 \quad \sin^2 \theta = 1 - \cos^2 \theta$$

$$I12 \quad \sec^2 \theta = 1 + \tan^2 \theta$$

$$I13 \quad 1 + \cot^2 \theta = \csc^2 \theta$$

$$I11 \quad \cos^2 \theta = 1 - \sin^2 \theta$$

Cofunction Identities

$$I14 \quad \sin(\pi/2 - \theta) = \cos \theta$$

$$I16 \quad \tan(\pi/2 - \theta) = \cot \theta$$

$$I18 \quad \sec(\pi/2 - \theta) = \csc \theta$$

$$I15 \quad \cos(\pi/2 - \theta) = \sin \theta$$

$$I17 \quad \cot(\pi/2 - \theta) = \tan \theta$$

$$I19 \quad \csc(\pi/2 - \theta) = \sec \theta$$

Even/Odd Identities

$$I20 \quad \cos(-\theta) = \cos \theta$$

$$I22 \quad \sin(-\theta) = -\sin \theta$$

$$I24 \quad \tan(-\theta) = -\tan \theta$$

$$I21 \quad \sec(-\theta) = \sec \theta$$

$$I23 \quad \csc(-\theta) = -\csc \theta$$

$$I25 \quad \cot(-\theta) = -\cot \theta$$

Sum and difference Identities

$$I26 \quad \cos(x+y) = \cos x \cos y - \sin x \sin y$$

$$I27 \quad \cos(x-y) = \cos x \cos y + \sin x \sin y$$

$$I30 \quad \tan(x+y) = \frac{\sin(x+y)}{\cos(x+y)} = \frac{\sin x \cos y + \sin y \cos x}{\cos x \cos y - \sin x \sin y}$$

$$I31 \quad \tan(x-y) = \frac{\sin(x-y)}{\cos(x-y)} = \frac{\sin x \cos y - \sin y \cos x}{\cos x \cos y + \sin x \sin y}$$

$$I28 \quad \sin(x+y) = \sin x \cos y + \sin y \cos x$$

$$I29 \quad \sin(x-y) = \sin x \cos y - \sin y \cos x$$

$$\frac{\sin x \cos y + \sin y \cos x}{\cos x \cos y - \sin x \sin y}$$

$$\frac{\sin x \cos y - \sin y \cos x}{\cos x \cos y + \sin x \sin y}$$

$$\frac{\tan x + \tan y}{1 - \tan x \tan y}$$

$$\frac{\tan x - \tan y}{1 + \tan x \tan y}$$

Double Angle Identities

$$I32 \quad \sin 2\theta = 2 \sin \theta \cos \theta$$

$$I33 \quad \cos 2\theta = 1 - 2 \sin^2 \theta$$

$$\textcircled{C} \cos 2\theta = 2 \cos^2 \theta - 1$$

$$\textcircled{A} \cos 2\theta = \cos^2 \theta - \sin^2 \theta$$