Trig Formulas and Identities

Is your calculator in DEG or RAD mode?

Reciprocal and Quotient Identities

$$\sin\theta = \frac{1}{\csc\theta} \qquad \csc\theta = \frac{1}{\sin\theta}$$

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

$$\tan\theta = \frac{1}{\cot\theta} \qquad \cot\theta = \frac{1}{\tan\theta}$$

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

Pythagorean Identities

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

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

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

Even/Odd

$$\sin(-\theta) = -\sin(\theta) \qquad \cos(-\theta) = \cos(\theta) \qquad \tan(-\theta) = -\tan(\theta)$$

Compound Angle

$$\sin(A + B) = \sin A\cos B + \cos A\sin B \qquad \sin(A - B) = \sin A\cos B - \cos A\sin B$$

$$\cos(A + B) = \cos A\cos B - \sin A\sin B \qquad \cos(A - B) = \cos A\cos B + \sin A\sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A\tan B} \qquad \tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A\tan B}$$

Double Angle

$$\sin(2A) = 2\sin A\cos A \qquad \cos(2A) = \cos^2 A - \sin^2 A$$

$$\tan(2A) = \frac{2\tan A}{1 - \tan^2 A} \qquad \cos(2A) = 2\cos^2 A - 1$$

$$\cos(2A) = 1 - 2\sin^2 A$$

Triangles

$$a^2 = b^2 + c^2 - 2bc\ \cos A$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Other

arc length = θ x r

degrees → radians x $\frac{\pi}{180^\circ}$

radians → degrees x $\frac{180^\circ}{\pi}$

$$y = \pm amp\left(\sin\left(\frac{2\pi}{per}(x - P.S.)\right)\right) + S.A.$$