

USEFUL RELATIONSHIPS

S	A
T	C

θ is an acute angle

$$\sin\left(\frac{\pi}{2} + \theta\right) = \cos\theta$$

$$\sin\left(\frac{\pi}{2} - \theta\right) = \cos\theta$$

$$\cos\left(\frac{\pi}{2} + \theta\right) = -\sin\theta$$

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin\theta$$

$$\sin(\pi - \theta) = \sin\theta$$

$$\sin(\pi + \theta) = -\sin\theta$$

$$\cos(\pi - \theta) = -\cos\theta$$

$$\cos(\pi + \theta) = -\cos\theta$$

$$\sin\left(\frac{2\pi}{3} + \theta\right) = -\cos\theta$$

$$\sin\left(\frac{2\pi}{3} - \theta\right) = -\cos\theta$$

$$\cos\left(\frac{2\pi}{3} + \theta\right) = \sin\theta$$

$$\cos\left(\frac{2\pi}{3} - \theta\right) = -\sin\theta$$

$$\sin(2\pi + \theta) = \sin\theta$$

$$\sin(2\pi - \theta) = -\sin\theta$$

$$\cos(2\pi + \theta) = \cos\theta$$

$$\cos(2\pi - \theta) = \cos\theta$$

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

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

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

$$\log_a(mn) = \log_a m + \log_a n$$

$$\log_a\left(\frac{m}{n}\right) = \log_a m - \log_a n$$

$$\log_a(m)^n = n \log_a m$$

$$\log_a(m) = (\log_b m)(\log_a b)$$

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

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

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

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

$$\sin C + \sin D = 2 \sin \left(\frac{C+D}{2} \right) \cos \left(\frac{C-D}{2} \right)$$

$$\sin C - \sin D = 2 \cos \left(\frac{C+D}{2} \right) \sin \left(\frac{C-D}{2} \right)$$

$$\cos C + \cos D = 2 \cos \left(\frac{C+D}{2} \right) \cos \left(\frac{C-D}{2} \right)$$

$$\cos C - \cos D = 2 \sin \left(\frac{C+D}{2} \right) \sin \left(\frac{D-C}{2} \right)$$

$$2 \sin A \cos B = \sin(A+B) + \sin(A-B)$$

$$2 \cos A \sin B = \sin(A+B) - \sin(A-B)$$

$$2 \cos A \cos B = \cos(A+B) + \cos(A-B)$$

$$2 \sin A \sin B = \cos(A-B) - \cos(A+B)$$

$$\sin 2A = 2 \sin A \cos A$$

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

$$\sin 3A = 3 \sin A - 4 \sin^3 A$$

$$\cos 3A = 4 \cos^3 A - 3 \cos A$$