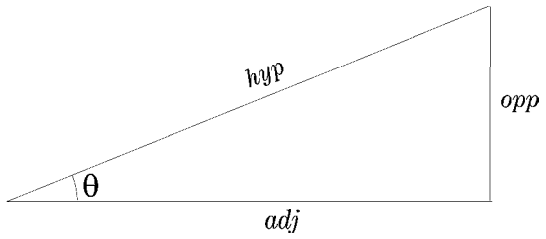
FORMULAS

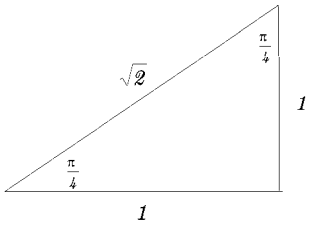
$$\begin{aligned} x^2 - a^2 &= (x-a)(x+a) \\ x^2 + (a+b)x + ab &= (x+a)(x+b) \\ x^3 + a^3 &= (x+a)(x^2 - ax + a^2) \\ x^3 - a^3 &= (x-a)(x^2 + ax + a^2) \\ (x+a)^3 &= x^3 + 3ax^2 + 3x^2x + a^3) \end{aligned}$$

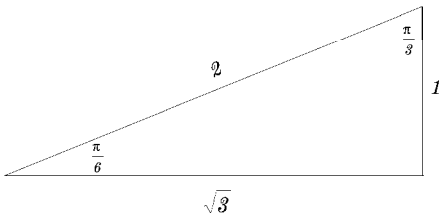
$ax^2 + bx + c = 0$ has solution $x = \frac{1}{2a}(-b \pm \sqrt{b^2 - 4ac})$.

$$\tan\theta = \frac{\sin\theta}{\cos\theta} \qquad \cot\theta = \frac{\cos\theta}{\sin\theta} \qquad \sec\theta = \frac{1}{\cos\theta} \qquad \csc\theta = \frac{1}{\sin\theta}$$



$$\sin\theta = \frac{opp}{hyp} \qquad \cos\theta = \frac{adj}{hyp} \qquad \tan\theta = \frac{opp}{adj} \qquad \cot\theta = \frac{adj}{opp} \qquad \sec\theta = \frac{hyp}{adj} \qquad \csc\theta = \frac{hyp}{opp}$$



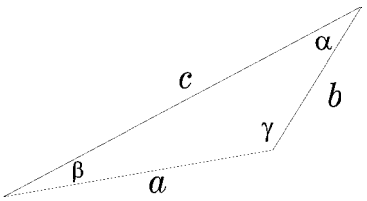


$$\begin{array}{lll} \sin 0 = 0 & \cos 0 = 1 & \tan 0 = 0 \\ \sin\frac{\pi}{2} = 1 & \cos\frac{\pi}{2} = 0 & \tan\frac{\pi}{2} \text{ DNE} \\ \sin\pi = 0 & \cos\pi = -1 & \tan\pi = 0 \end{array}$$

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

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

$$\begin{aligned} \sin(\theta+\phi) &= \sin\theta\cos\phi + \cos\theta\sin\phi \\ \sin(2\theta) &= 2\sin\theta\cos\theta \\ \cos(\theta+\phi) &= \cos\theta\cos\phi - \sin\theta\sin\phi \\ \cos 2\theta &= \cos^2\theta - \sin^2\theta \;=\; 2\cos^2\theta - 1 \;=\; 1 - 2\sin^2\theta \end{aligned}$$



$$c^2 = a^2 + b^2 - 2ab\cos\gamma$$