College Algebra - Trigonometry Formula Sheet

Addition Formulas

$$\sin(s + t) = \sin(s)\cos(t) + \cos(s)\sin(t)$$

$$\cos(s + t) = \cos(s)\cos(t) - \sin(s)\sin(t)$$

Double-Angle Formulas

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

$$\cos(2x) = 2\cos^2(x) - 1$$

Formulas for lowering powers

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

$$\cos^2(x) = \frac{1 + \cos(2x)}{2}$$

Half-Angle Formulas

$$\sin(x/2) = \pm\sqrt{\frac{1 - \cos(x)}{2}}$$

$$\cos(x/2) = \pm\sqrt{\frac{1 + \cos(x)}{2}}$$

Product-To-Sum Formulas

$$\sin(x)\cos(y) = \frac{1}{2}\left(\sin(x + y) + \sin(x - y)\right)$$

$$\cos(x)\cos(y) = \frac{1}{2}\left(\cos(x + y) + \cos(x - y)\right)$$

$$\sin(x)\sin(y) = \frac{1}{2}\left(\cos(x - y) - \cos(x + y)\right)$$

Sum-To-Product Formulas

$$\sin(x) + \sin(y) = 2\left(\sin\left(\frac{x + y}{2}\right)\cos\left(\frac{x - y}{2}\right)\right)$$
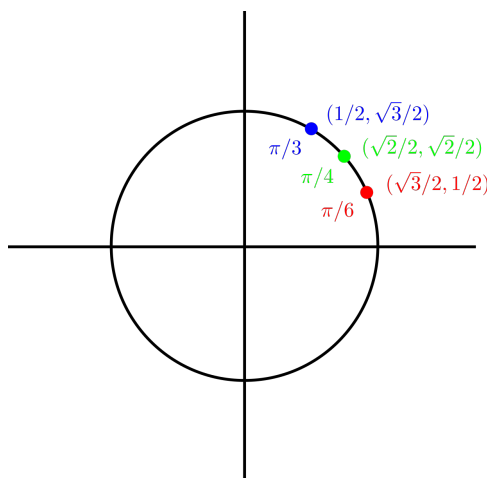
$$\cos(x) + \cos(y) = 2\left(\cos\left(\frac{x + y}{2}\right)\cos\left(\frac{x - y}{2}\right)\right)$$

Figure 1: The Unit Circle