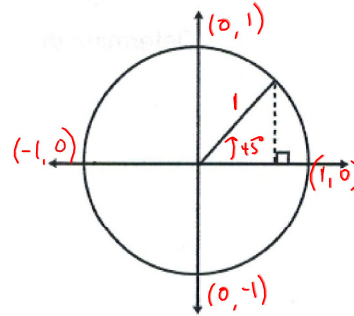


Pre-Calculus 12 The Special Circle

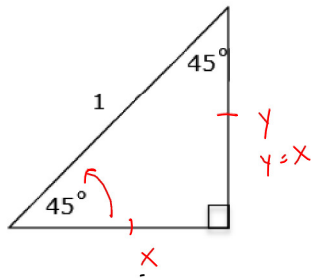
Equation of the Unit Circle

A circle, with centre at the origin and radius 1 unit, has the equation $x^2 + y^2 = 1$.

Determining Coordinates:

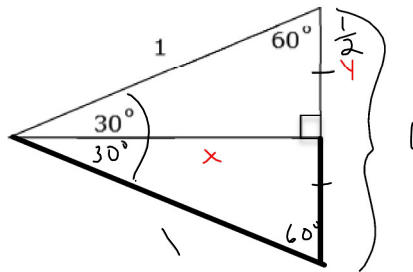


$$45^\circ \text{ or } \frac{\pi}{4}$$



$$\begin{aligned} x^2 + x^2 &= 1^2 \\ 2x^2 &= 1 \\ x^2 &= \frac{1}{2} \\ x &= \pm \frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right) \\ &= \pm \frac{\sqrt{2}}{2} \end{aligned}$$

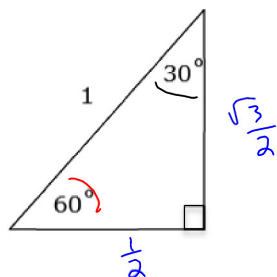
$$30^\circ \text{ or } \frac{\pi}{6}$$



$$\begin{aligned} x^2 + \left(\frac{1}{2}\right)^2 &= 1^2 \\ x^2 &= 1 - \frac{1}{4} \\ x^2 &= \frac{3}{4} \\ x &= \pm \frac{\sqrt{3}}{2} \\ \left(\pm \frac{\sqrt{3}}{2}, \pm \frac{1}{2} \right) \end{aligned}$$

The Special Circle.notebook

60° or $\frac{\pi}{3}$



$$\left(\pm \frac{1}{2}, \pm \frac{\sqrt{3}}{2}\right)$$

Examples

1. Find the exact value of $\cos \frac{16\pi}{3}$.

$$-\frac{1}{2}$$

coterminal w/ $4\frac{\pi}{3}$

(x, y)

$(\cos \theta, \sin \theta)$

2. Find the exact value of $\sin\left(-\frac{9\pi}{2}\right)$.

$$-1$$

change π to $\frac{3\pi}{3}$

2π to $\frac{6\pi}{3}$

Count by 3s

3. Find the exact value of $\sin^2 \frac{5\pi}{6}$

$$\left(\frac{1}{2}\right)^2 = \frac{1}{4}$$