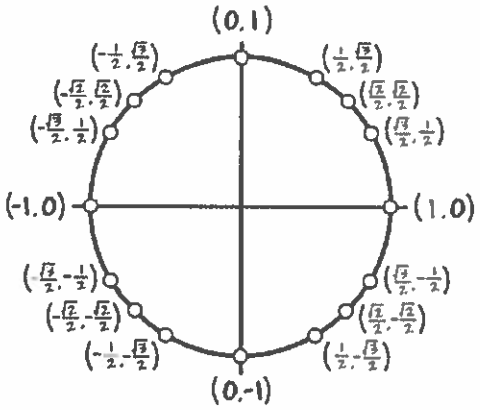
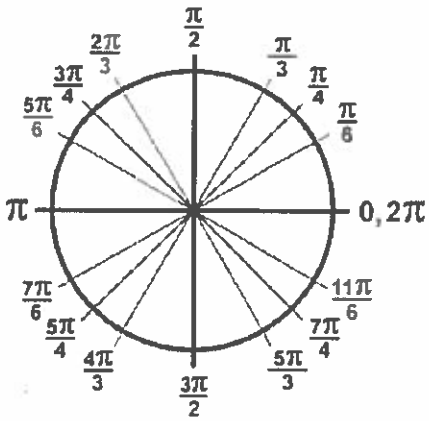
AP Calculus AB Stuff You Need to Know from Precalculus Name: _____

The Unit Circle





Equation of a line with slope m through the point (x_1, y_1)

$$y - y_1 = m(x - x_1)$$

Radicals

$$\text{If } x^2 = a, \text{ then } x = \pm a$$

Even and Odd Functions

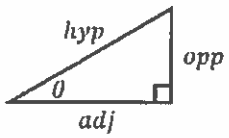
Even Function: $f(-x) = f(x)$
Odd Function: $f(-x) = -f(x)$

Trig Identities

$$\tan x = \frac{\sin x}{\cos x} \qquad \cot x = \frac{\cos x}{\sin x} \qquad \sin^2 x + \cos^2 x = 1$$

$$\csc x = \frac{1}{\sin x} \qquad \sec x = \frac{1}{\cos x} \qquad 1 - \sin^2 x = \cos^2 x$$

$$\sin x = \frac{1}{\csc x} \qquad \cos x = \frac{1}{\sin x} \qquad 1 - \cos^2 x = \sin^2 x$$



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

Exponents and Logarithms

$$a^0 = 1, a \neq 0 \qquad a^1 = a \qquad \ln 1 = 0 \qquad \ln\left(\frac{m}{n}\right) = \ln m - \ln n$$

$$a^m \cdot a^n = a^{m+n} \qquad \frac{a^m}{a^n} = a^{m-n} \qquad \ln e = 1 \qquad \ln(m^n) = n \ln m$$

$$(a^m)^n = a^{mn} \qquad a^{-m} = \frac{1}{a^m} \qquad \ln(mn) = \ln m + \ln n \qquad e^{\ln x} = x = \ln e^x$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m \qquad log_b x = y \Leftrightarrow b^y = x \qquad log_b x = \frac{\ln x}{\ln b}$$

Inverse Trig

$$\theta = \sin^{-1} x \Leftrightarrow x = \sin\theta \qquad \sin^{-1} x = \arcsin x$$

$$\theta = \cos^{-1} x \Leftrightarrow x = \cos\theta \qquad \cos^{-1} x = \arccos x$$

$$\theta = \tan^{-1} x \Leftrightarrow x = \tan\theta \qquad \tan^{-1} x = \arctan x$$

Function	Domain	Range
$\theta = \sin^{-1} x$	$-1 \leq x \leq 1$	$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$
$\theta = \cos^{-1} x$	$-1 \leq x \leq 1$	$0 \leq x \leq \pi$
$\theta = \tan^{-1} x$	$-\infty \leq x \leq \infty$	$-\frac{\pi}{2} < x < \frac{\pi}{2}$

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

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

$$\tan^2\theta = \frac{1-\cos(2\theta)}{1+\cos(2\theta)}$$

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

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta$$

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

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

$$\tan(2\theta) = \frac{2\tan\theta}{1 - \tan^2\theta}$$

$$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \sin\beta\cos\alpha$$

$$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan\alpha \pm \tan\beta}{1 \mp \tan\alpha\tan\beta}$$

$$Area\ of\ a\ triangle = \frac{1}{2}absinC$$