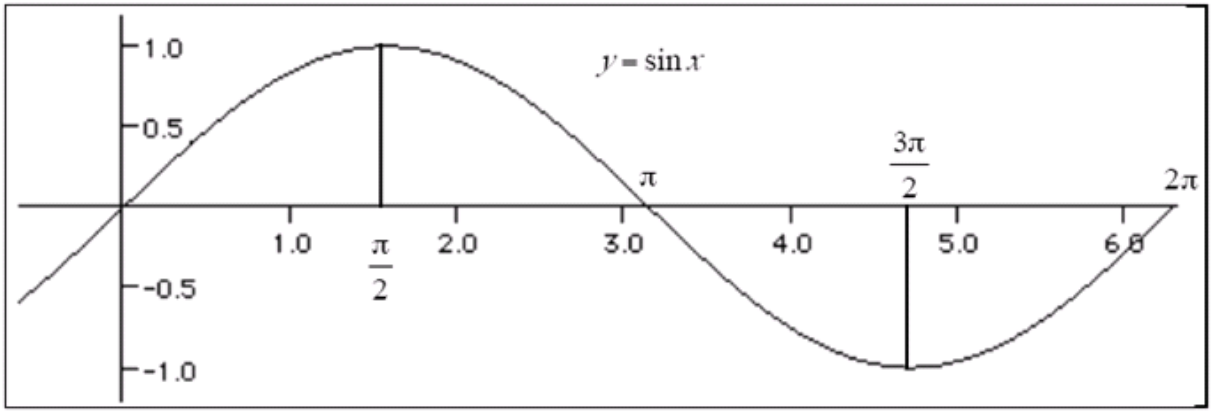
Section 3.5:
Derivatives of Trig Functions

I could make you use the limit definition to evaluate the derivative of $y = sin(x)$ and $y = cos(x)$. . . but I'm not that mean! Let's look at it graphically, instead.



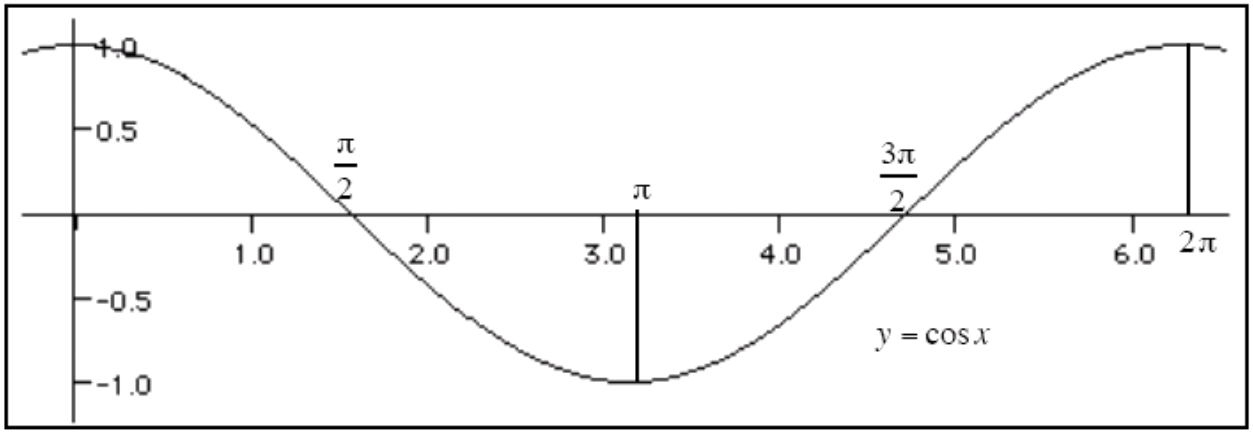
Estimate the slope of the tangent lines at the points listed below. fill in the chart, plot the points on the graph above.

x	0	$\pi/2$	π	$3\pi/2$	2π
$f(x)$					

Take a guess. . .

the derivative of $y = sin(x)$ is _____.

Let's look at the graph of cosine next.



Estimate the slope of the tangent lines at the points listed below. fill in the chart, plot the points on the graph above.

x	0	$\pi/2$	π	$3\pi/2$	2π
$f'(x)$					

Take a guess. . .

the derivative of $y = cos(x)$ is _____.

$$\frac{d}{dx}[\tan x]$$

$$\frac{d}{dx}[\cot x]$$

$$\frac{d}{dx}[\sec x]$$

$$\frac{d}{dx}[\csc x]$$

Derivatives of the six trig functions

$\frac{d}{dx}[\sin x] =$ _____

$\frac{d}{dx}[\cos x] =$ _____

$\frac{d}{dx}[\tan x] =$ _____

$\frac{d}{dx}[\cot x] =$ _____

$\frac{d}{dx}[\sec x] =$ _____

$\frac{d}{dx}[\csc x] =$ _____

Find each derivative - remember to use the power, product, and quotient rules when needed!

(1) $f(x) = 2\sin x$

(2) $h(x) = \frac{\pi}{2}\cos x$

(3) $q(x) = x^2 \cos x$

(4) $y = \frac{1-\cos x}{\sin x}$

Find the equation of the tangent line and normal lline to the function at the given point.

(1) $f(x)=\csc x \quad at\left(\frac{\pi}{4},\frac{2}{\sqrt{2}}\right)$

(2) $g(x)=-3\tan x \quad at\ x=\frac{\pi}{4}$

Find the point(s) where the graph of $q(x) = \csc x - \cot x$ on the interval from $[0, 2\pi]$ is parallel to the line $2x - 2y = 3$.