

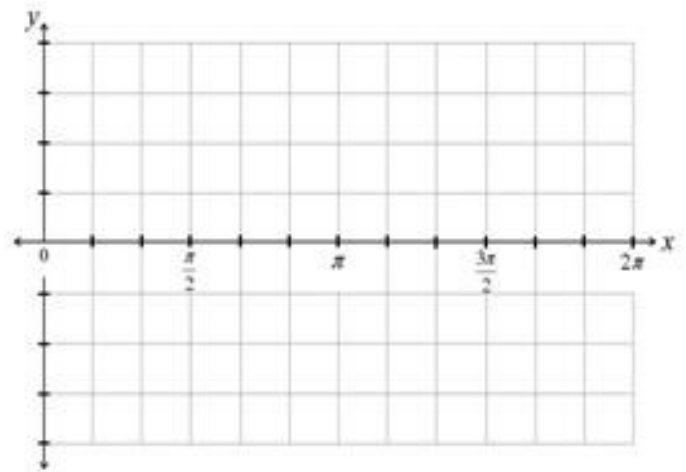
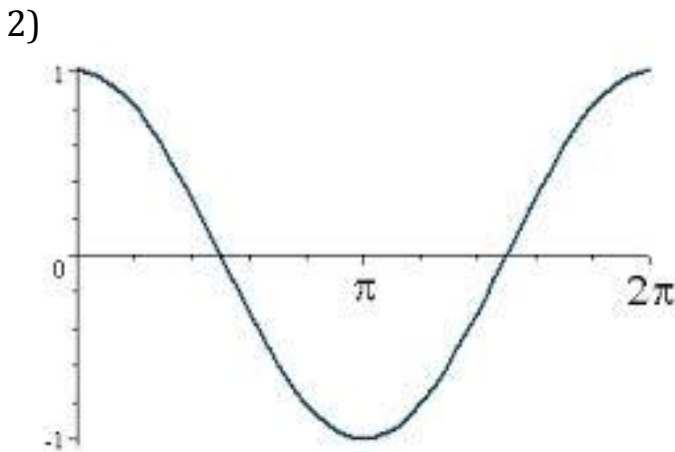
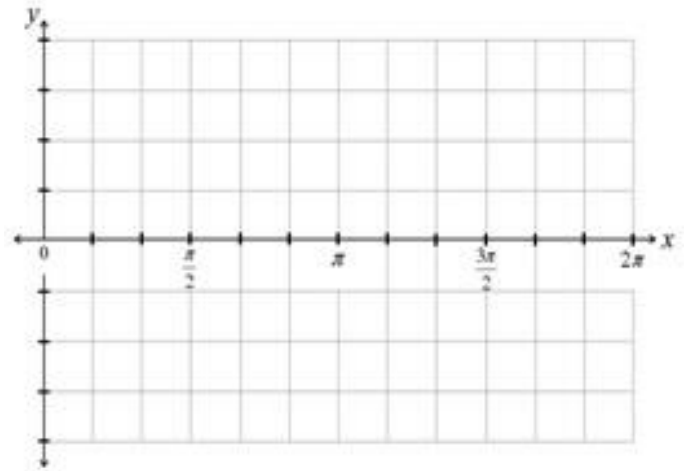
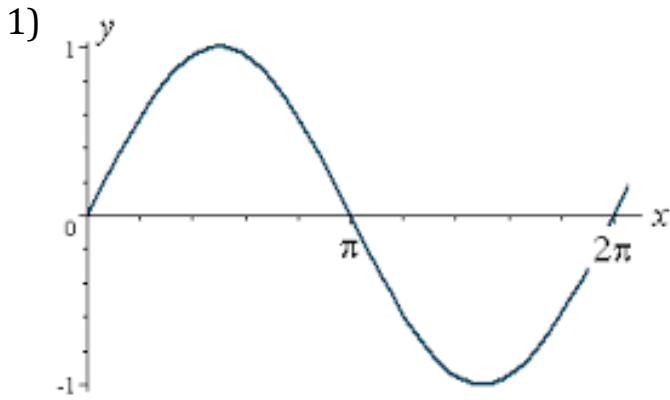
Unit #7: Differentiation

Topic: Trigonometric Derivatives

Objective: SWBAT find the derivatives of trigonometric functions.

**Warm Up #4:**

Graph the derivative for each of the functions whose graphs are shown below by analyzing the slope of the curve at various points.



Using the graphs above, we now know

$$\frac{d}{dx} \sin x = \underline{\hspace{2cm}} \quad \text{and} \quad \frac{d}{dx} \cos x = \underline{\hspace{2cm}}$$

The derivatives of the six trigonometric functions have to be memorized since they are used often.

We can find the derivative of ***tanx*** by using the derivatives *sinx*, *cosx*, and the quotient rule.

$$\frac{d}{dx} \tan x =$$

Derivatives of the remaining trig functions can be determined the same way.

$\frac{d}{dx} \sin x = \underline{\hspace{2cm}}$	$\frac{d}{dx} \cos x = \underline{\hspace{2cm}}$
$\frac{d}{dx} \tan x = \underline{\hspace{2cm}}$	$\frac{d}{dx} \cot x = \underline{\hspace{2cm}}$
$\frac{d}{dx} \sec x = \underline{\hspace{2cm}}$	$\frac{d}{dx} \csc x = \underline{\hspace{2cm}}$

*Examples: Find the derivative for each of the following.*

a)  $f(x) = 2\sin x + x^2$

b)  $f(x) = x\cot x + 5x$

*Problem Set #4: Find the derivative for each of the following.*

1)  $y = 2\sin x - \tan x$

2)  $f(x) = 3x^2\sec x$

3)  $g(x) = \frac{4}{\cos x}$

4)  $y = \frac{5}{x}\csc x$

5)  $f(x) = \sqrt{x} + \cot x$

6)  $h(x) = x\sin x + \cos x$

7) $y = 2\sin x \cos x$	8) $h(x) = -\csc x - \frac{1}{2}\sin x$
9) $f(x) = \frac{\sec x}{2x}$	10) $y = \tan x \cot x$
11) $y = \frac{\tan x}{3x^4}$	12) $g(x) = (3x - 1)(\cos x)$
13) $y = 3x^2 \sin x$	14) $h(x) = -7\csc x + x^3 - 1$
15) $y = -2x \sin x - 3\cos x$	16) $f(x) = \frac{\cos x}{1 + \sin x}$

