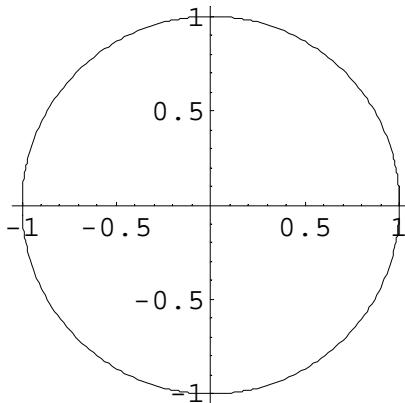


Trigonometric Review

The Unit Circle



- This circle is a circle with radius = 1, hence the name, the unit circle.
- The equation for the circle is $x^2 + y^2 = 1$
- The circumference of the circle is $2\pi r$, so the circumference of the unit circle is 2π .
- $\frac{1}{4}$ of the way around is $\pi/2$
- $\frac{1}{2}$ of the way around is π
- $\frac{3}{4}$ of the way around is $3\pi/4$
- all the way around is 2π

Note that $x^2 + y^2 = 1$ so $\cos^2(\theta) + \sin^2(\theta) = 1$. On the unit circle, the x -values represent the cosine value and the y -values represent the sine value. Label the intercept points with (cosine, sine).

1. Fill in the table below:

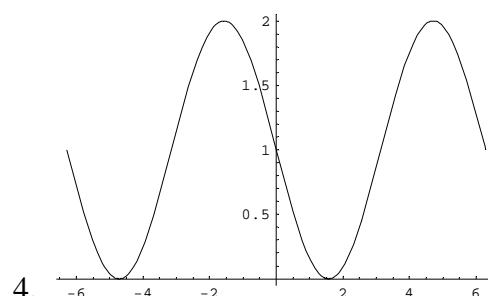
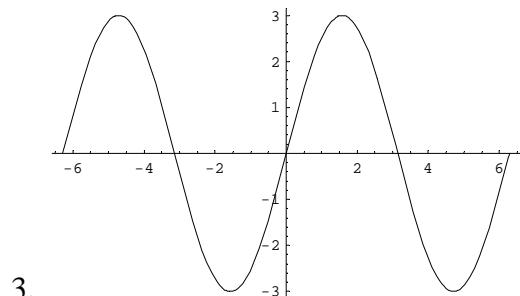
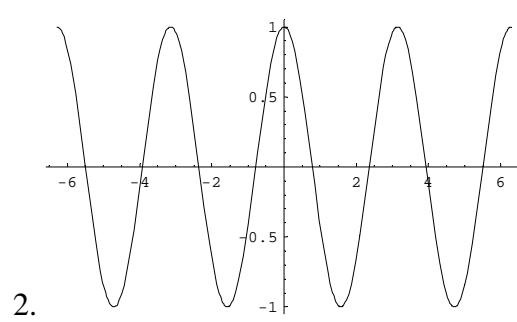
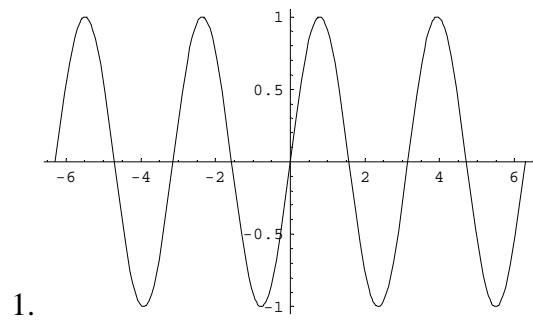
Radians	θ	$\cos(\theta)$	$\sin(\theta)$
0			
$\pi/2$			
π			
$3\pi/2$			
2π			

2. What is: $\cos(\pi/4)$ _____ $\sin(\pi/4)$ _____

Does this make sense? Why?

Trigonometric Graphs

1. Graph the $\cos(t)$ and the $\sin(t)$.
 2. Match four of the following functions to the graphs below; then graph the remaining two functions.
- a. $f(x) = 1 + \sin(x)$ b. $g(x) = 1 - \sin(x)$
c. $h(x) = 3 \cos(x)$ d. $r(x) = \cos(2x)$
e. $s(x) = 3 \sin(x)$ f. $m(x) = \sin(2x)$



5.

6.

Radians and Degrees

Conversions: π radians = 180 degrees

$$1 \text{ radian} = (180/\pi) \text{ degrees}$$

$$1 \text{ degree} = (\pi/180) \text{ radians}$$

1. Find the radian measure of the angle when given the degree measure:

a. 36 degrees

b. 200 degrees

c. 45 degrees

d. -72 degrees

e. 60 degrees

f. 115 degrees

g. -135 degrees

h. 150 degrees

i. -420 degrees

2. Find the degree measure of the angle with the following radian measure:

a. $\frac{3\pi}{4}$

b. $\frac{-7\pi}{2}$

c. $\frac{5\pi}{6}$

d. $\frac{-\pi}{12}$

e. -1.5

f. $\frac{2\pi}{9}$

g. $\frac{\pi}{5}$

h. $\frac{\pi}{18}$

i. $\frac{5\pi}{3}$

Trigonometric Identities

Simplify the following trigonometric expressions:

1. $\sin^2(x) + \cos^2(x) - 1$

2. $(\sin(x) + \cos(x))^2 + 2 \cos(x)$

3. $(\sin(x)) * (\cos^2(x)) + \sin^3(x) - 2$

4. $2 \cos^2(x) + \sin^2(x) + 1$