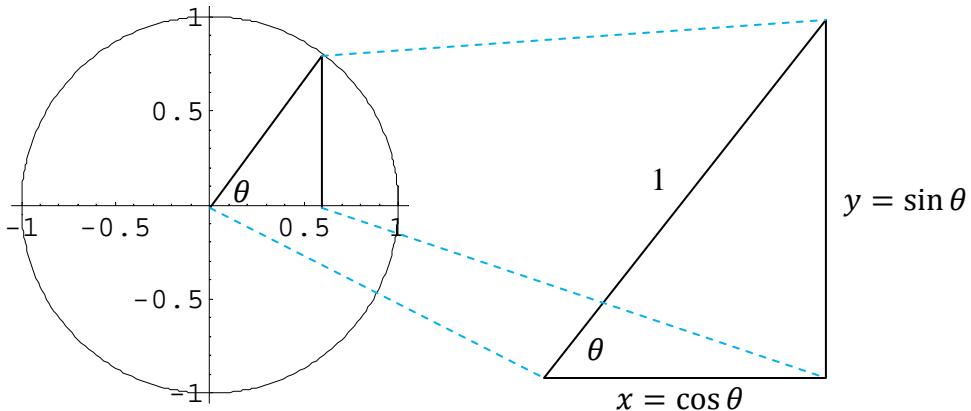


Trigonometric Review

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 on the unit circle the x -values represent the cosine value and the y -values represent the sine value, so if $x^2 + y^2 = 1$, then $(\cos \theta)^2 + (\sin \theta)^2 = 1$. Label the x - and y -intercepts for the following angles:

1. Fill in the table below:

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

2. What is: $\cos(\frac{\pi}{4})$ _____ $\sin(\frac{\pi}{4})$ _____

Does this make sense? Why?

Trigonometric Graphs

1. Graph $\cos t$ and $\sin t$.

2. Match four of the following functions to the graphs below; then graph the remaining two functions.

a. $f(x) = 1 + \sin x$

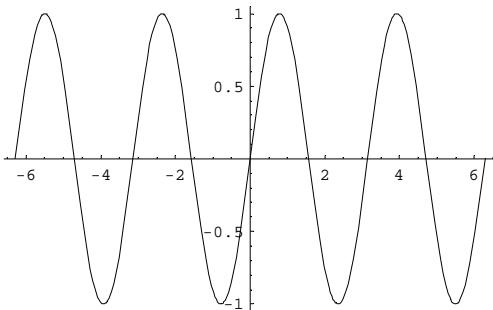
b. $g(x) = 1 - \sin x$

c. $h(x) = 3 \cos x$

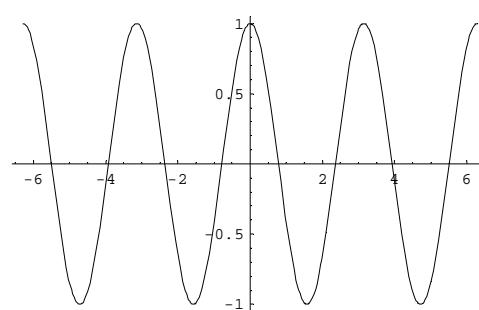
d. $r(x) = \cos 2x$

e. $s(x) = 3 \sin x$

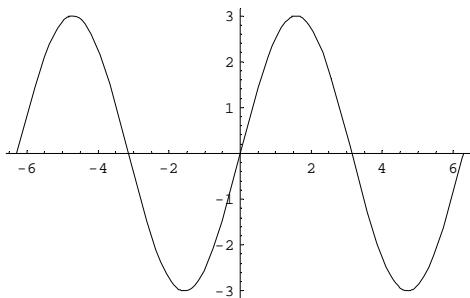
f. $m(x) = \sin 2x$



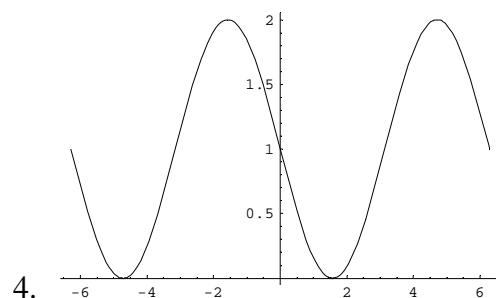
1.



2.



3.



4.

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

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

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

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