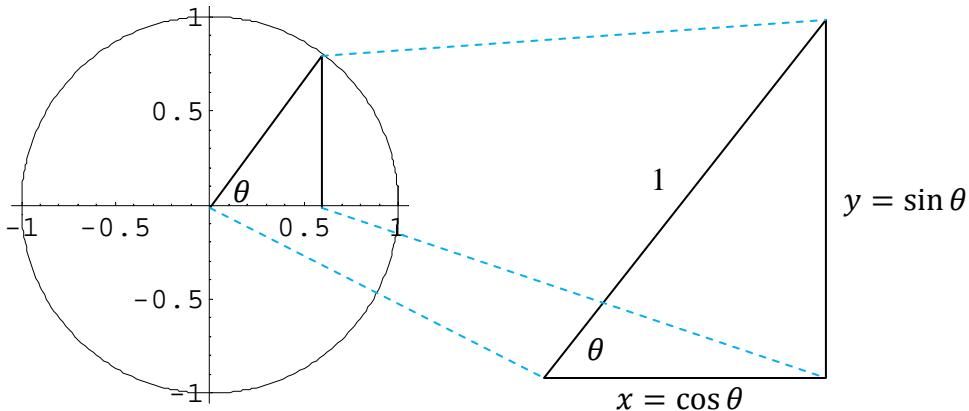


Trigonometric Review

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

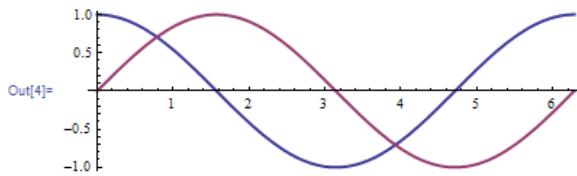
1. Fill in the table below:

θ (Radians)	$\cos \theta$	$\sin \theta$
0	1	0
$\pi/2$	0	1
π	-1	0
$3\pi/2$	0	-1
2π	1	0

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

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

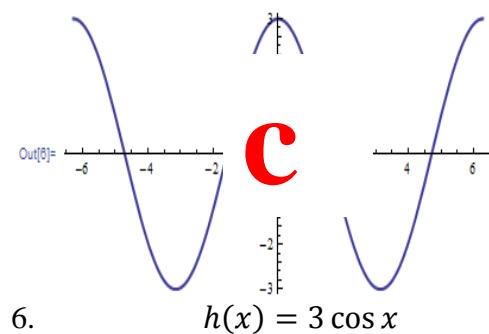
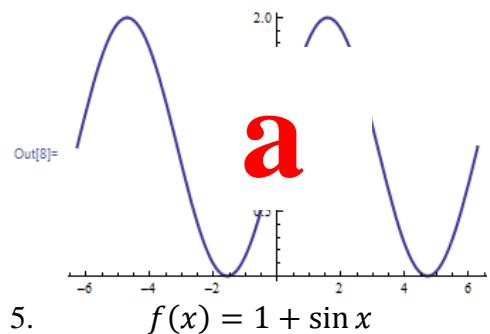
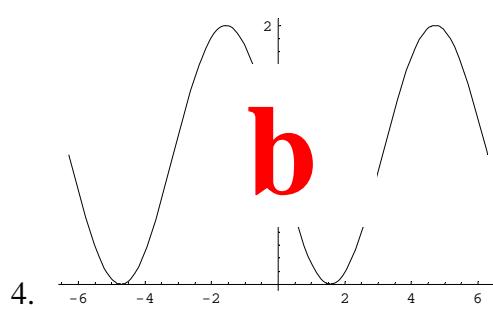
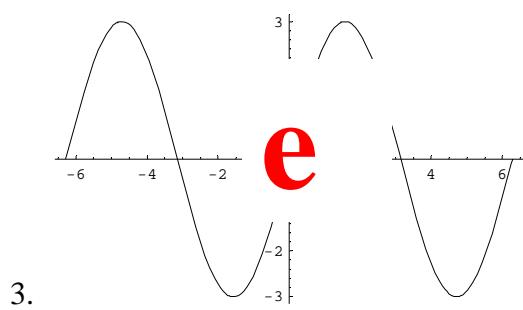
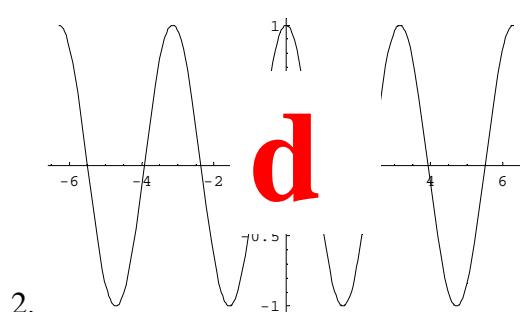
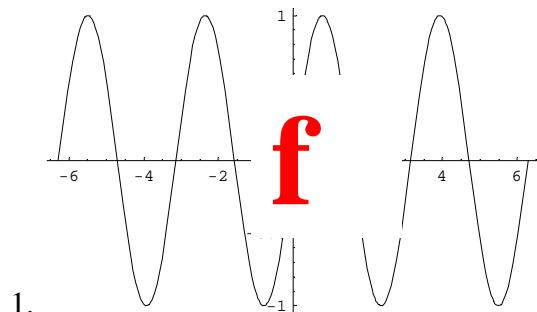
b. $g(x) = 1 - \sin x$

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

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

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

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



Radians and Degrees

Conversions: π radians = 180 degrees
1 radian = $(180/\pi)$ degrees
1 degree = $(\pi/180)$ radians

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

- a. 36 degrees = $\frac{\pi}{5}$ radians b. 200 degrees = $\frac{10\pi}{9}$ radians
c. 45 degrees = $\frac{\pi}{4}$ radians d. -72 degrees = $-\frac{2\pi}{5}$ radians
e. 60 degrees = $\frac{\pi}{3}$ radians f. 115 degrees = $\frac{25\pi}{36}$ radians
g. -135 degrees = $-\frac{3\pi}{4}$ radians h. 150 degrees = $\frac{5\pi}{6}$ radians
i. -420 degrees = $-\frac{7\pi}{3}$ radians

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

- a. $\frac{3\pi}{4}$ = **135 degrees** b. $\frac{-7\pi}{2}$ = **-450 degrees**
c. $\frac{5\pi}{6}$ = **150 degrees** d. $\frac{-\pi}{12}$ = **15 degrees**
e. $-1.5 = -\frac{270}{\pi}$ degrees f. $\frac{2\pi}{9} = 40$ degrees
g. $\frac{\pi}{5} = 36$ degrees h. $\frac{\pi}{18} = 10$ degrees
i. $\frac{5\pi}{3} = 300$ degrees

Trigonometric Identities

Simplify the following trigonometric expressions:

1. $(\sin \theta)^2 + (\cos \theta)^2 - 1 = \mathbf{0}$
2. $(\sin \theta + \cos \theta)^2 + 2 \cos \theta = \mathbf{1 + 2 \cos \theta + \sin 2\theta}$
3. $(\sin \theta)(\cos \theta)^2 + (\sin \theta)^3 - 2 = \mathbf{\sin \theta - 2}$
4. $2(\cos \theta)^2 + 2(\sin \theta)^2 + 1 = \mathbf{3}$