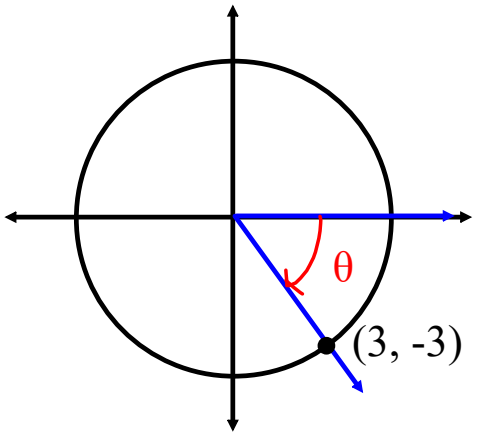
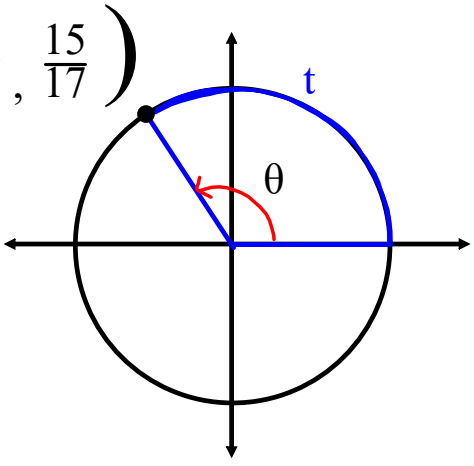
Section 4.2 Trigonometric Functions: The Unit Circle

Find the exact values of the six trigonometric functions of θ.

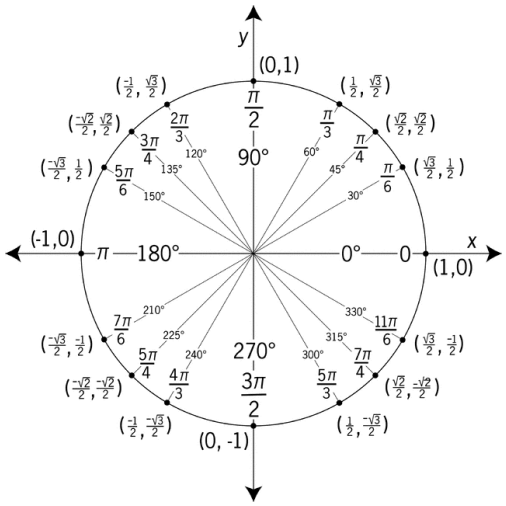


Find the exact values of the six trigonometric functions of the real number *t*.

$\left(-\frac{8}{17}, \frac{15}{17}\right)$



Find the point (x, y) on the unit circle that corresponds to the real number *t*.



$t = 11\pi/6$

$t = -4\pi/3$

Evaluate (if possible) the sine, cosine, and tangent at the real number.

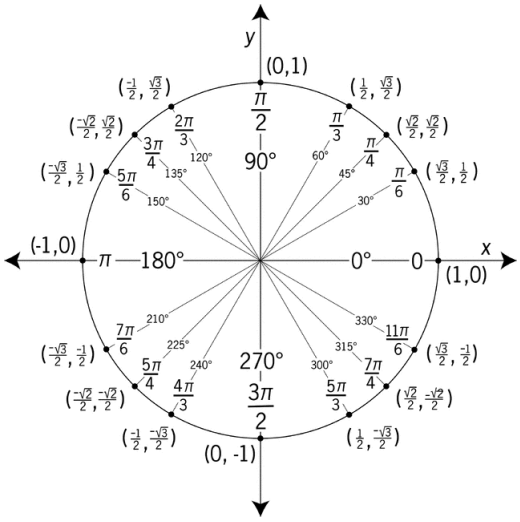
$t = 5\pi/3$

$t = -\pi$

Evaluate (if possible) the six trigonometric functions at the real number.

$t = 7\pi/4$

$t = -3\pi/2$



Evaluate the trigonometric function using its period as an aid.

$\cos(3\pi)$

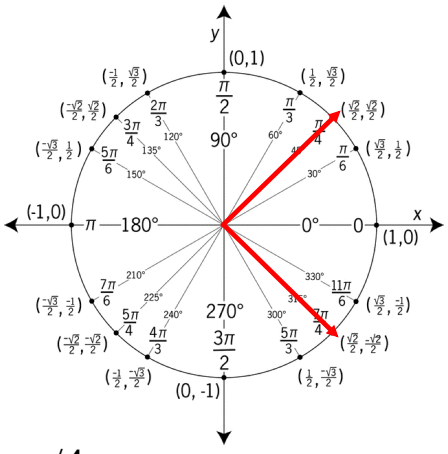
$\sin(9\pi/4)$

$\sin(-8\pi/3)$

Even and Odd Trigonometric Functions

The cosine and secant functions are **even**.

$\cos(-t) = \cos t$ $\sec(-t) = \sec t$



What does this mean?

check values of cosine where $t = \pi/4$ and $t = -\pi/4$

Use the given value to evaluate each function: $\cos t = -3/4$

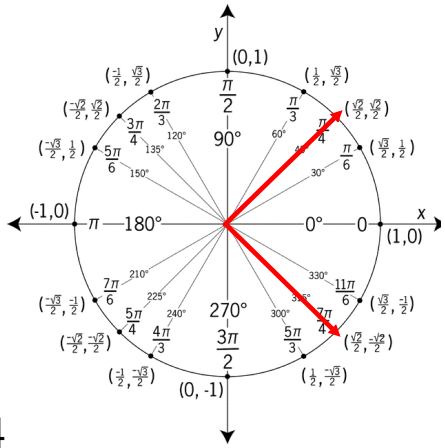
a) $\cos(-t)$ b) $\sec(-t)$

Even and Odd Trigonometric Functions

The sine, cosecant, tangent, and cotangent functions are **odd**.

$\sin(-t) = -\sin t$ $\csc(-t) = -\csc t$

$\tan(-t) = -\tan t$ $\cot(-t) = -\cot t$



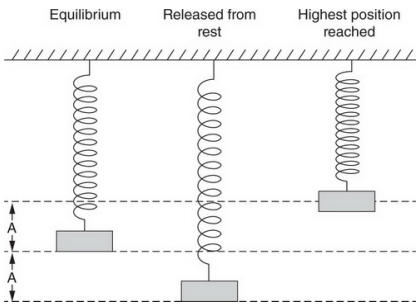
What does this mean?

check values of sine where $t = \pi/4$ and $t = -\pi/4$

Use the given value to evaluate each function: $\sin(-t) = 3/8$

a) $\sin t$ b) $\csc t$

The displacement from equilibrium of an oscillating weight suspended by a spring is given by $y(t) = \frac{1}{4}\cos 6t$, where y is the displacement (in feet) and t is the time (in seconds). Find the displacements when a) $t = 0$, b) $t = \frac{1}{4}$, and c) $t = \frac{1}{2}$.



The displacement from equilibrium of an oscillating weight suspended by a spring and subject to the damping effect of friction is given by $y(t) = \frac{1}{4}e^{-t}\cos 6t$, where y is the displacement (in feet) and t is the time (in seconds).

a) Complete the table

t	0	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1
y					

b) Use the table feature of a graphing utility to approximate the time when the weight reaches equilibrium.

c) What appears to happen to the displacement as t increases?

Section 4.2 Pgs. 275-276: #5-12, 13-41 odd, 43-50