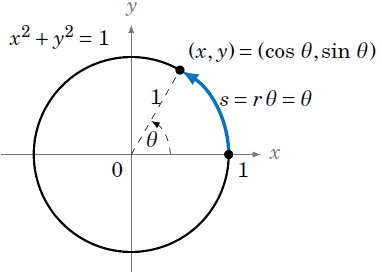
# The Function named sin(θ)

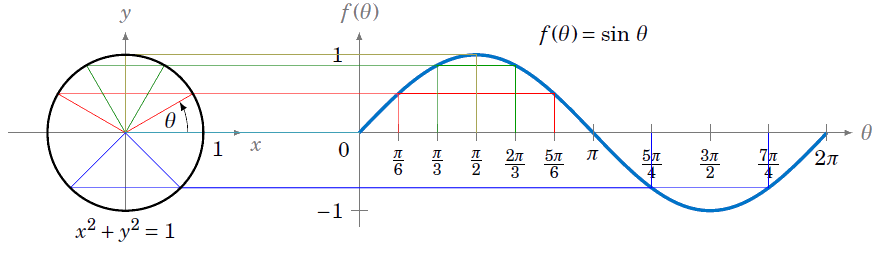
**Trigonometric Basic Graphs**

We will describe a geometrical way to create the graph, using the unit circle. This is the circle of radius 1 in the-plane consisting of all which satisfy the equation .

We see in Figure 1 that any point on the unit circle has coordinates where is the angle that the line segment from the origin to makes with the positive x-axis (by definition of sine and cosine). So as the point ( goes around the circle, its y-coordinate is

We thus get a correspondence between the y-coordinates of points on the unit circle and the values , as shown by the horizontal lines from the unit circle to the graph of in Figure 2.

Figure



Figure

Notice the graph is positive (above the x-axis) when the trig. ratios of sine are in quadrant I and II and negative when the trig. ratios are in quadrant III and IV.

# If we rotate the circle in a clockwise direction, then the angles are represented using negative values. Use the CAST rule, sine is negative in quadrant III and IV and positive in quadrant I and II. Notice the graph represents this.

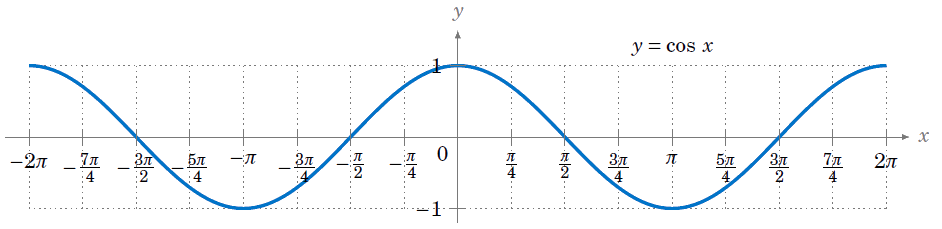
# Graph of y = sin x

# To see an interactive video, go to

# <http://www.intmath.com/trigonometric-graphs/1-graphs-sine-cosine-amplitude.php> and click “start”.

# The Function named cos(θ)

# To graph the cosine function, we could again use the unit ircle idea (using the x-coordinate of a point that moves around the circle), but there is an easier way. Recall that for all So has the same value as , has the same value as , has the same value as and so on. In other words, the graph of the cosine function is just the graph of the sine function shifted to the left by radians, as in Figure 3.



# To see an interactive video of the cosine curve use the same link as above but scroll down to start the next graph.

# The Function named tan(θ)

1. Complete the following table of values for  by using the trigonometric identity , to find the exact values for .
2. Sketch the graph of  using the values found in (A).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Value of θ**  **(radians)** | 0 |  |  |  |  |  |  |  | π |  |  |  |  |  |  |  | 2π |
| Exact Value  of sin(θ) |  |  |  |  | 1 |  |  |  |  |  |  |  | -1 |  |  |  |  |
| Exact Value Of  cos(θ) | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Exact Value Of  tan(θ) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



**θ**