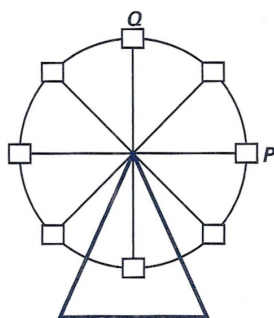
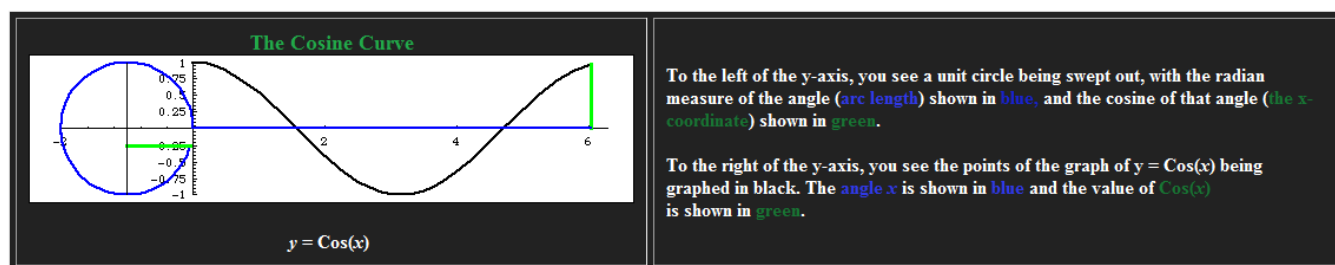
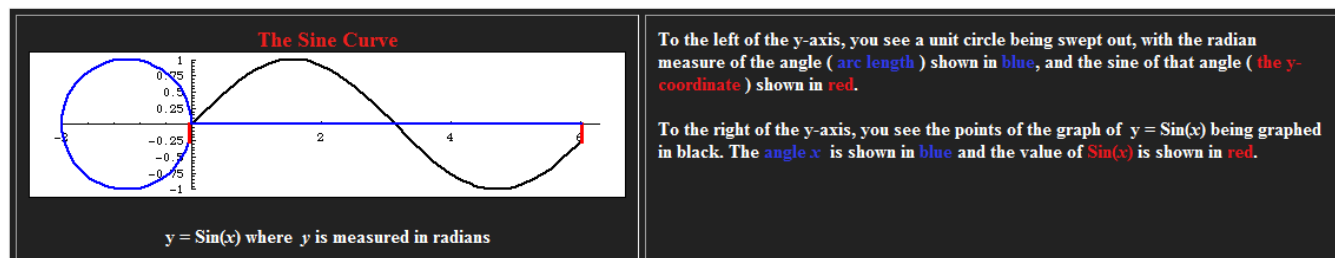


We just saw a video showing us how to translate the unit circle onto a graph. Now let's try this ourselves.

1. In the diagram below there is a unit circle on the left and as you go around the circle counterclockwise from the point (0,0) you can sketch the graph which is done for you.
2. Take a moment and with your index fingers trace this process as it unfolded in the video we saw. The first graph is the sine curve which started at (0,0).
3. The second sketch starts out at the top of the unit circle which results in the cosine curve. Again with your index fingers trace this motion and see how the sketch unfolds like in the video.



Hopefully you can 'see' this how this process happens. Now assume the unit circle is a Ferris Wheel of height 2 (unit circle so the radius is 1 unit!)

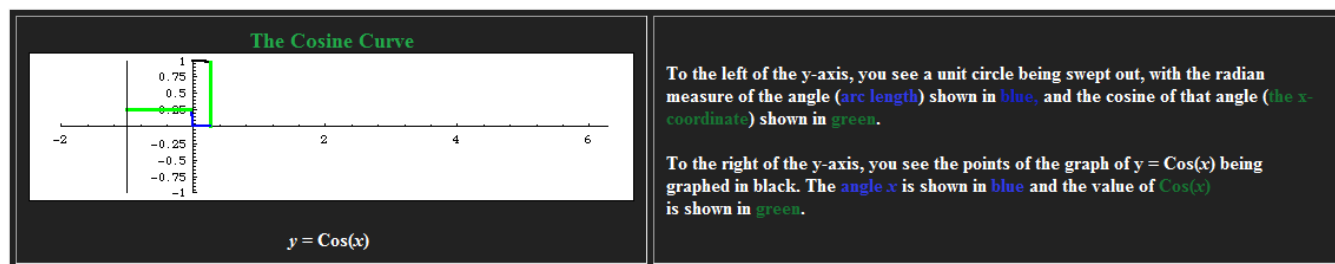
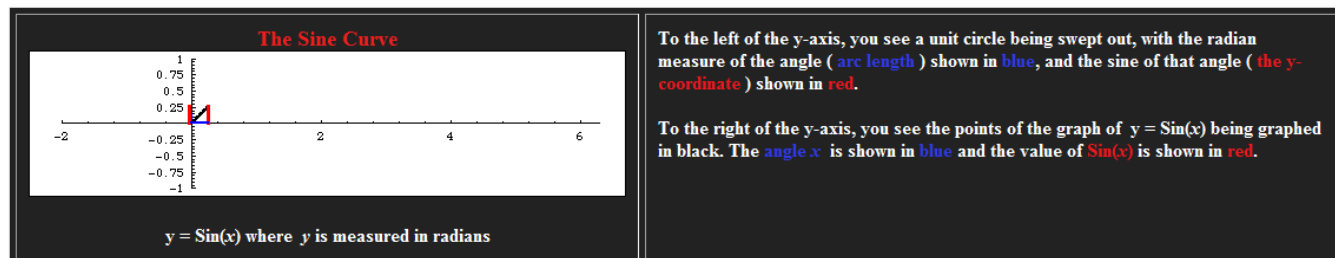
Step 1: label the period (cycle of the ride around a Ferris wheel), this Ferris wheel has a circumference of  $2\pi$

Step 2: divide the period into 4 equal parts and put a 'dot' at each of those spots.

Step 3: Label the midline on the Ferris wheel.

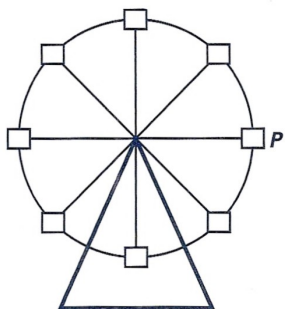
Step 4: Begin to sketch the path created as we go around the Ferris wheel starting out at point P.

Step 5: Repeat the process for the second graph by starting out at point Q



Now lets try this with some context:

We go to the fair and want to ride the Ferris wheel. The Ferris wheel is 30 feet tall and takes 12 seconds to make one complete revolution (one cycle). Start sketching the graph assuming the rider is at point P.



Step 1: label the midline

Step 2: find the amplitude (radius of the Ferris wheel)

Step 3: label the period on the graph

Step 4: sketch the graph

Step 5: Calculate B  $\frac{2\pi}{B} = \text{Period}$   $\frac{2\pi}{\text{Period}} = B$

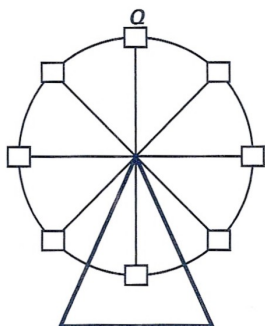
Step 5: Now that you have A and B write a function (equation) which represents the graph in the form of:

$$f(x) = A \sin(Bx)$$



Now lets try this with some context:

We go to the fair and want to ride the Ferris wheel. The Ferris wheel is 30 feet tall and takes 12 seconds to make one complete revolution (one cycle). Start sketching the graph assuming the rider is at point Q.



Step 1: label the midline

Step 2: find the amplitude (radius of the Ferris wheel)

Step 3: label the period on the graph

Step 4: sketch the graph

Step 5: Calculate B  $\frac{2\pi}{B} = \text{Period}$   $\frac{2\pi}{\text{Period}} = B$

Step 5: Now that you have A and B write a function (equation) which represents the graph in the form of:

$$f(x) = A \cos(Bx)$$

