Graphing a basic sine curve

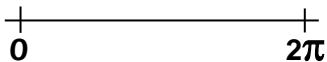# y = sin x

$\frac{\pi}{2}$

(0, 1)

(-1, 0)
π

(1, 0)
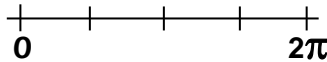2π

(0, -1)

$\frac{3\pi}{2}$
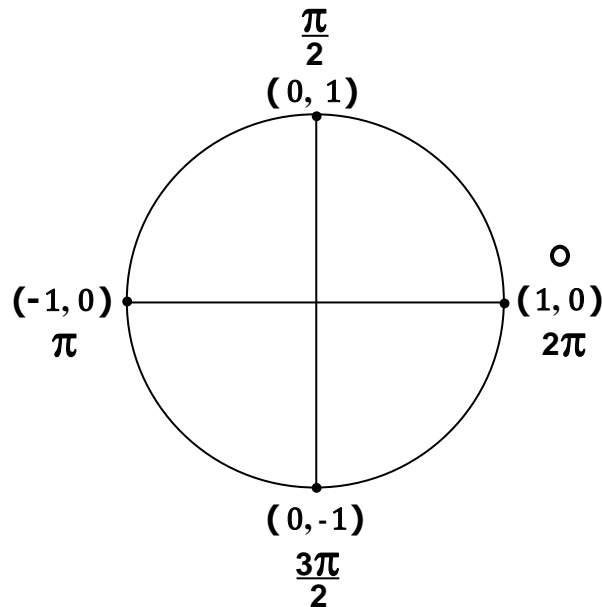
To understand the basic sine curve, set up the unit circle and then "unwrap" it counterclockwise starting from 0 radians and moving all the way around to 2π radians. Find sine (the y value) for each angle:
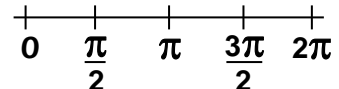
One complete cycle goes from 0 to 2π.

$\sin(0)$ = 0   sin x at 0 radians is 0

$\sin(\frac{\pi}{2})$ = 1   sin x at π/2 radians is 1

$\sin(\pi)$ = 0   sin x at π radians is 0

$\sin(\frac{3\pi}{2})$ = -1   sin x at 3π/2 radians is -1

$\sin(2\pi)$ = 0   sin x at 2π radians is 0
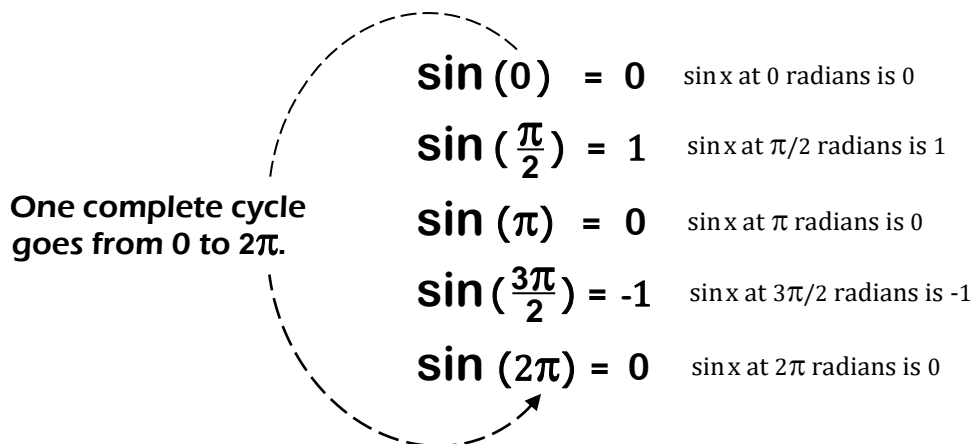
A. Set up a cycle from 0 to 2π:

0   2π

B. Cut it into four equal parts:

0   2π

C. Finish labeling the x - axis:

0   $\frac{\pi}{2}$ π $\frac{3\pi}{2}$ 2π
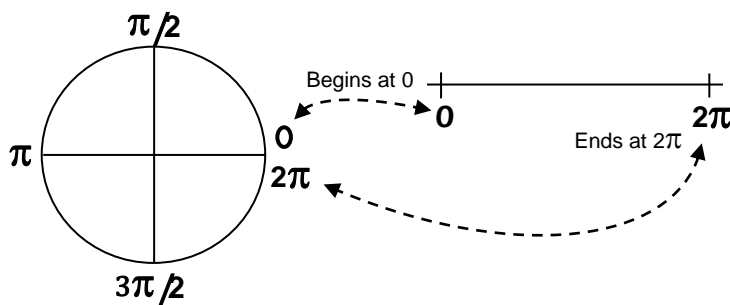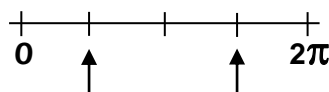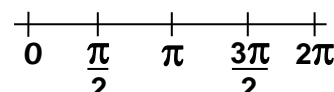
Graphing sine (what we've done so far)

Refer to the unit circle to help set up the graph of sine. One complete cycle is from 0 to 2π. This is where the basic graph of y = sin x begins and ends.
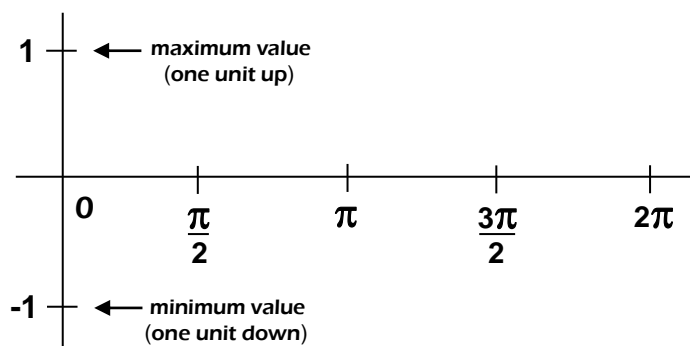

π /2

π

0
2π

3π /2

Begins at 0

0

2π

Ends at 2π
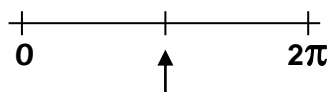
Cut the graph in half.

0   2π

Cut it in half again.

0   2π

Use the unit circle to complete the x-axis.

$0 \quad \frac{\pi}{2} \quad \pi \quad \frac{3\pi}{2} \quad 2\pi$

Now you can draw and label the y-axis. The cycle begins at 0, which is where the y-axis is located. The amplitude is 1 on the basic sine graph: one unit above the x-axis and one unit below the x-axis.

1 — maximum value (one unit up)

$0 \qquad \frac{\pi}{2} \qquad \pi \qquad \frac{3\pi}{2} \qquad 2\pi$

-1 — minimum value (one unit down)

Sin x at 0, π, and 2π is 0. These are the zeros or x-intercepts. Place a point at each of these locations. Sin x at $\frac{\pi}{2}$ is 1 and -1 at $\frac{3\pi}{2}$. Place a point at each of these locations also.

1 • ← sin x at π/2

$0 \qquad \frac{\pi}{2} \qquad \pi \qquad \frac{3\pi}{2} \qquad 2\pi$

-1 • ← sin x at 3π/2
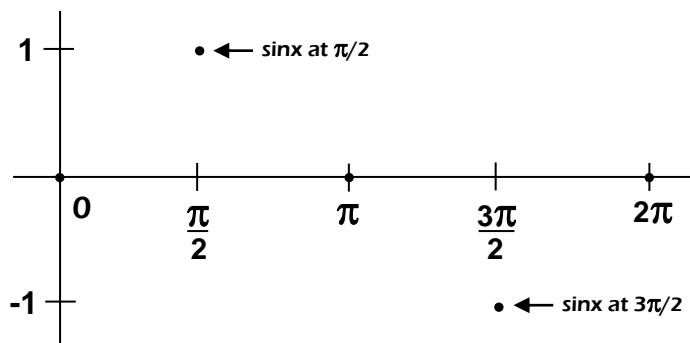
We will graph one wave of sine ∿ that begins at 0 and ends at 2π. Start your curve at 0, going up to the maximum value at x = $\frac{\pi}{2}$, down through π, continuing on to the minimum value at x = $\frac{3\pi}{2}$ and then back up to 2π.

1

$0 \qquad \frac{\pi}{2} \qquad \pi \qquad \frac{3\pi}{2} \qquad 2\pi$

-1