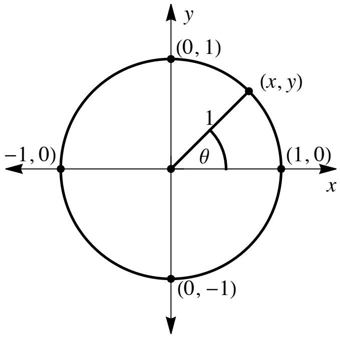
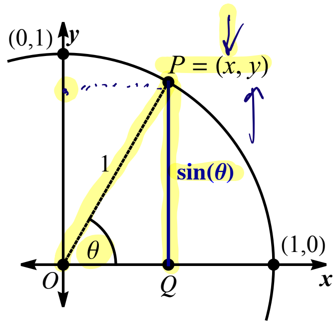
Trigonometry 8: The Definition of Sine

As we said when defining the cosine function, when began looking at points on the unit circle, we started by considering a radial line making an angle with the positive x-axis. We called the angle formed θ and we said the corresponding coordinate point on the unit circle had an x-coordinate x and a y-coordinate y, as shown in this figure:



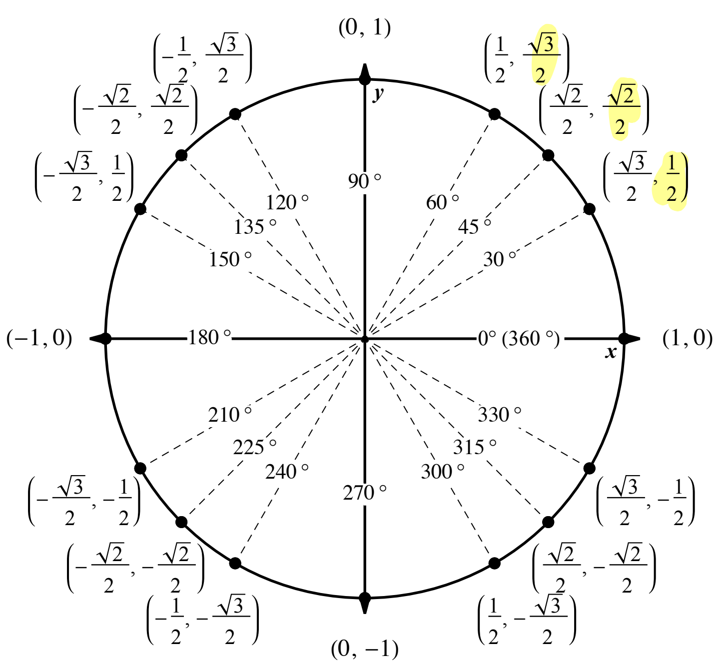
Consider again a Unit Circle with some point (in the first quadrant) with coordinate point $P = (x, y)$. As before, a radial line from this point to the origin (point O) makes an angle θ with the positive x-axis, as shown in the figure below:



Similarly, since it is very cumbersome for mathematicians to have to say "the corresponding y-coordinate for the point on the unit circle when a radial line makes an angle of θ degrees with the x-axis", they instead use shorthand notation:

$$\sin(\theta) = y$$

or, in words, the **sine** of θ is y. Again, sometimes the parentheses are omitted and we use: $\sin\theta = y$.



θ	$\sin\theta$	θ	$\sin\theta$
0°	0	180°	0
30°	1/2	210°	-1/2
45°	√2/2	225°	-√2/2
60°	√3/2	240°	-√3/2
90°	1	270°	-1
120°	√3/2	300°	-√3/2
135°	√2/2	315°	-√2/2
150°	1/2	330°	-1/2