4 Trigonometry and Euclid

4.1 Tues., Mar. 19: Representative triangles

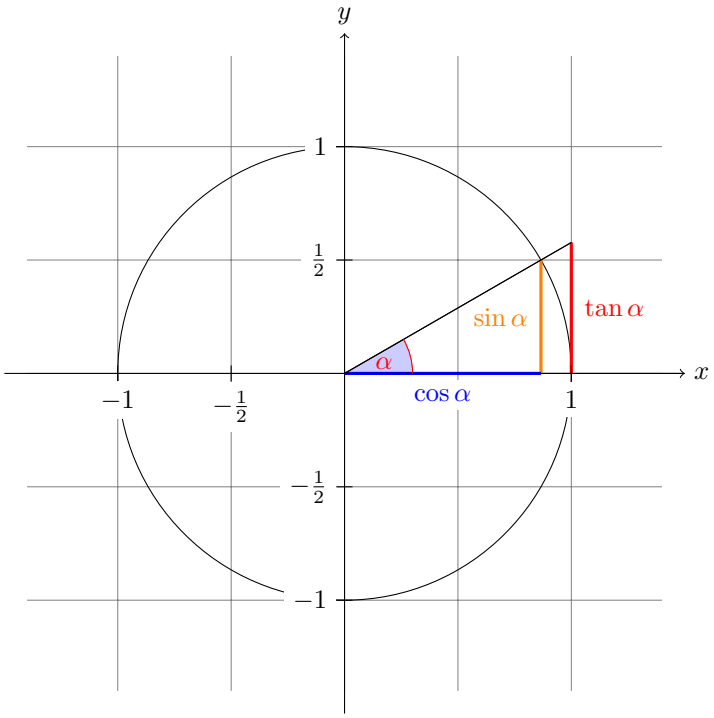
In calc we turn from degree measure to radian measure... as we learned from deriving π, there are 6.28 radius lengths in a circle and so we have the formula:

$$s = 2\pi r \tag{40}$$

So $\frac{2\pi}{2}$ is a half revolution, or 180 degrees. It's also useful to know that $\frac{\pi}{6} = 30°$, $\frac{\pi}{4} = 45°$, $\frac{\pi}{2} = 90°$. We can convert from degrees to radians easily by observing:

$$360° = 2\pi \text{ rad} \tag{41}$$

$\frac{\pi}{180°}$ is the conversion you most often want to multiply by.



The trig ratios are:

$$\begin{aligned} \sin(\theta) &= \tfrac{opposite}{hypotenuse} & \csc(\theta) &= \tfrac{h}{o} \\ \sin(\theta) &= \tfrac{opposite}{hypotenuse} & \csc(\theta) &= \tfrac{h}{a} \\ \sin(\theta) &= \tfrac{opposite}{hypotenuse} & \csc(\theta) &= \tfrac{a}{o} \end{aligned}$$

Exercise 44. *Find the trig ratios for the representative triangles* $45-45-90$ *and* $30-60-90$ *in each quadrant.*

Exercise 45. *Compute* $\sin(\theta)$ *for three* θ *you choose... then compute* $\cos(\theta - 90°)$ *for the same three* θ *values. What is their relationship? Why?*

4.2 Thurs., Mar. 21

4.3 Fri., Mar. 22