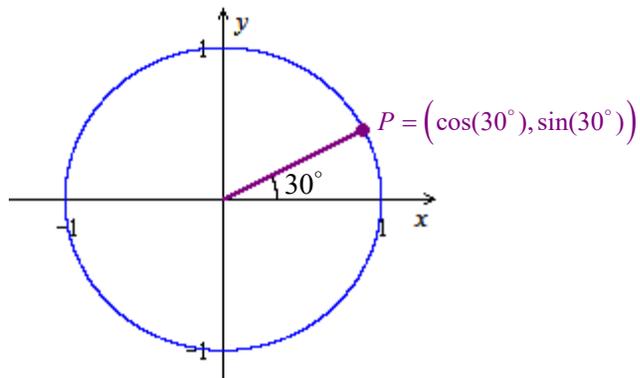


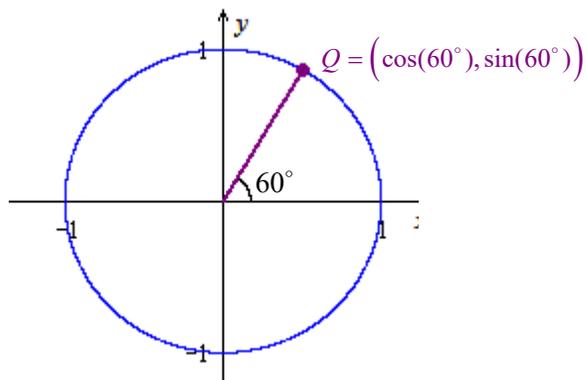
Intro to the Trigonometric Functions: Part 2

(these notes correspond to Parts 3 & 4 from my MTH 112 Online Lecture Notes)

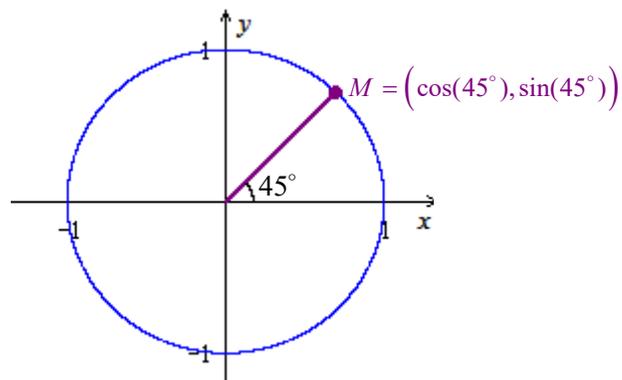
Now let's determine the sine and cosine of some important angles, namely, 30° , 45° , and 60° (i.e., $\frac{\pi}{6}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$). Let's start with $30^\circ = \frac{\pi}{6}$.



Now let's find the sine and cosine values for $60^\circ = \frac{\pi}{3}$.



Now let's find the sine and cosine values for $45^\circ = \frac{\pi}{4}$:



Since we now know the sine and cosine values of $\frac{\pi}{6}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$, and since sine and cosine represent, respectively, the vertical and horizontal coordinates of points on the circumference of a unit circle, we now know the coordinates of the points on the circumference of the unit circle specified by the angles $\frac{\pi}{6}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$; let's label the coordinates on the circle in Fig. 1.

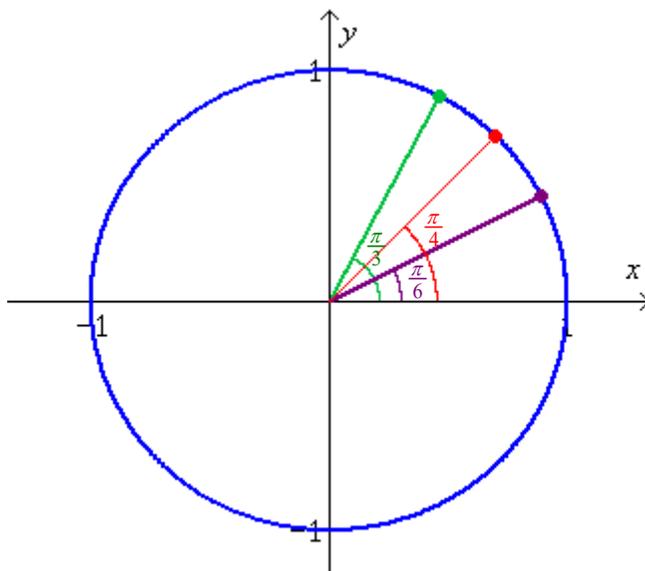


Figure 1

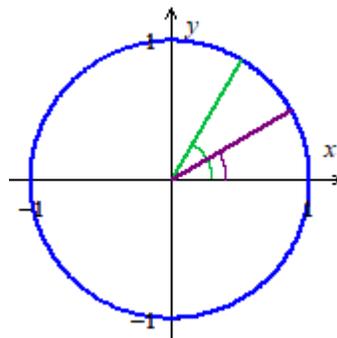
Now let's watch the [video](#) in Sect. I, Chapter 3, part 4 of the online lecture notes. (18 minutes)

Finding the sine and cosine of “friendly” angles:

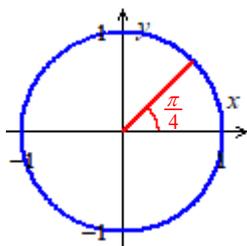
Let’s summarize what we’ve observed about the sine and cosine of multiples of $\frac{\pi}{6}$, $\frac{\pi}{4}$ or $\frac{\pi}{3}$:

Multiples of $\frac{\pi}{4}$:

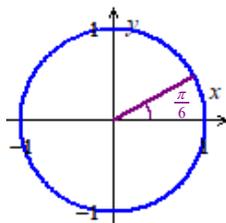
Multiples of $\frac{\pi}{6}$ and $\frac{\pi}{3}$:



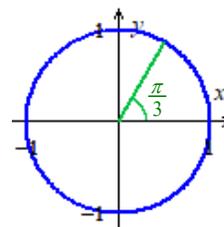
EXAMPLE: Find $\sin\left(\frac{21\pi}{4}\right)$, $\cos\left(\frac{21\pi}{4}\right)$, and $\tan\left(\frac{21\pi}{4}\right)$.



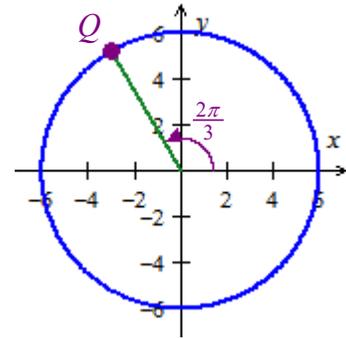
EXAMPLE: Find $\sin\left(\frac{17\pi}{6}\right)$, $\cos\left(\frac{17\pi}{6}\right)$, and $\sec\left(\frac{17\pi}{6}\right)$.



EXAMPLE: Find $\sin\left(\frac{14\pi}{3}\right)$, $\cos\left(\frac{14\pi}{3}\right)$, and $\csc\left(\frac{14\pi}{3}\right)$.



EXAMPLE: A circle with a radius of 6 units is given below. The point Q is specified by the angle $\frac{2\pi}{3}$. Use the sine and cosine function to find the exact coordinates of point Q .



Last slide from video: “Working with Multiples of $\frac{\pi}{6}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$ ”

