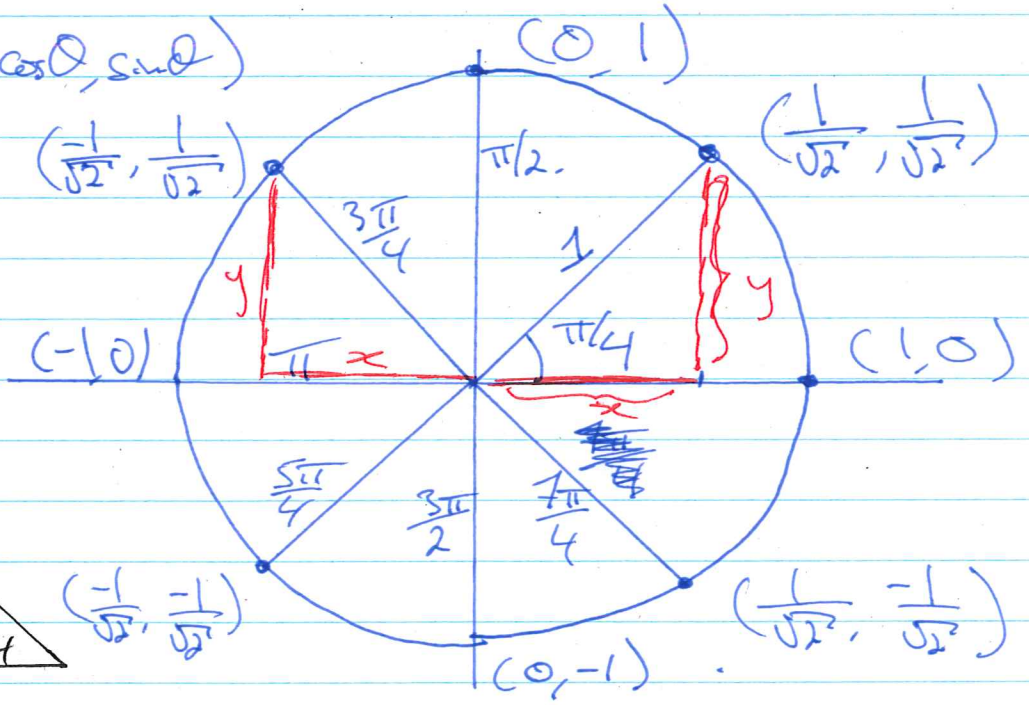
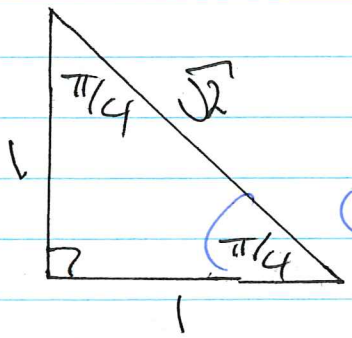
- HW1 Due Monday.
- Thursday Lab CIB moved to MATX 1100. Each week.
  ↑ Math Annex.
- MLC info Friday.
- Quiz #1 ~~Friday~~. info Friday.
  Quiz #1 Friday. 25th.

Let's go around the unit circle in multiples of $\pi/4$:

$(x,y) = (\cos\theta, \sin\theta)$



SOHCAH



$0, \pi/4, 2\pi/4, 3\pi/4, 4\pi/4, 5\pi/4, \frac{6\pi}{4}, \frac{7\pi}{4}.$

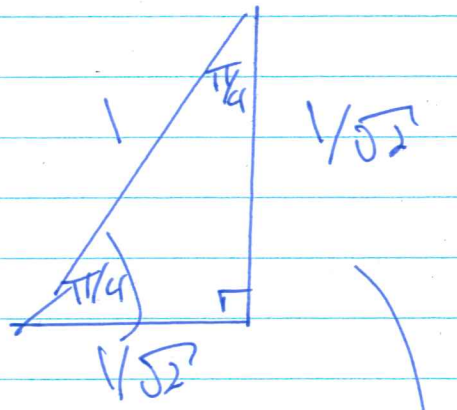
$= \pi/2$ $= \pi$ $= \frac{3\pi}{2}$.

(aside: $\frac{\sqrt{2}}{\sqrt{2}\sqrt{2}}$ $\frac{\sqrt{2}}{2}$ vs. $\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$)

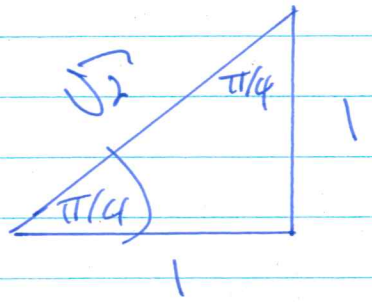
(2)

aside!

$\cos(\pi/4) = \frac{1}{\sqrt{2}}$

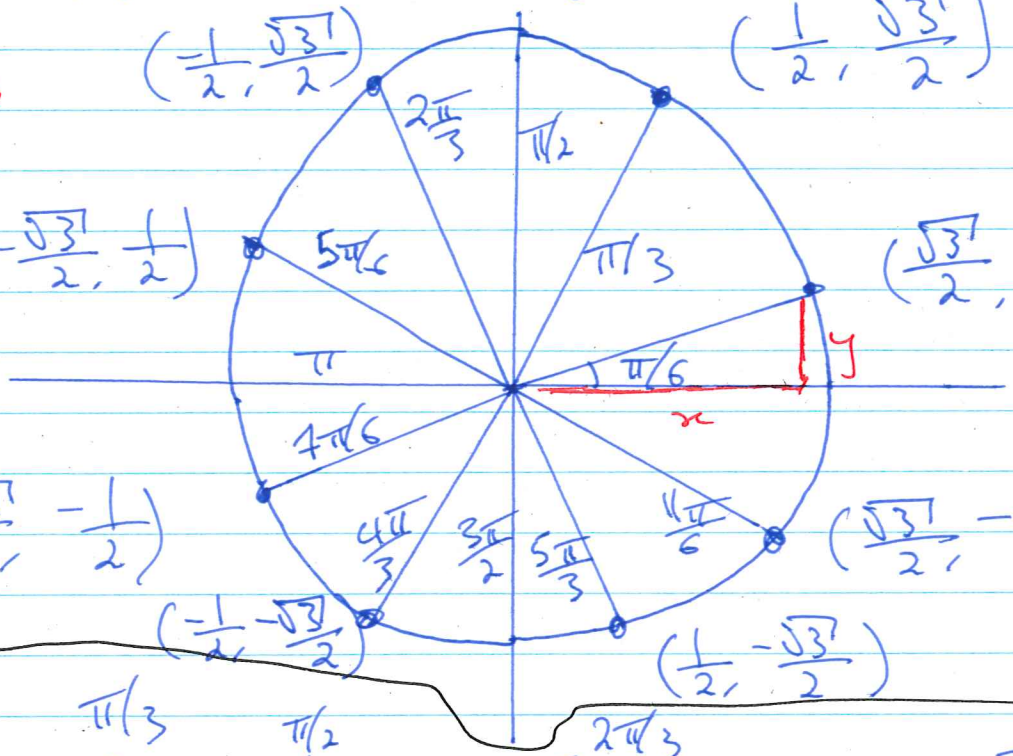


Similar triangles.



$\cos(\pi/4) = \frac{1}{\sqrt{2}}$

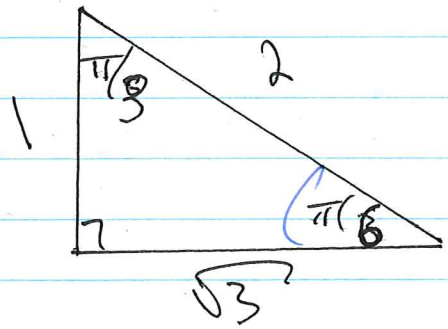
Now let us go around in multiples of $\pi/6$:



All Students Take Calculus.

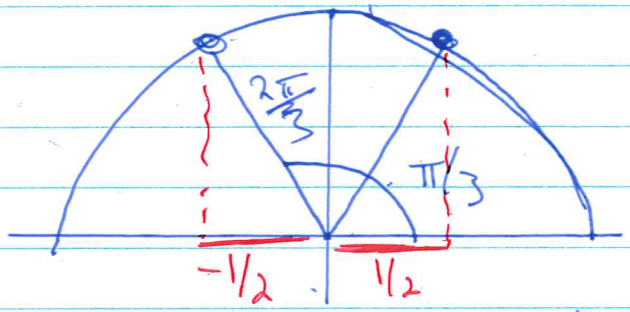
$\pi/3 = \frac{2\pi}{6}$ $\quad \pi/2 = \frac{3\pi}{6}$ $\quad 2\pi/3 = \frac{4\pi}{6}$ $\quad 5\pi/6$ $\quad \frac{6\pi}{6} = \pi$

$\frac{7\pi}{6}$ $\quad \frac{8\pi}{6} = \frac{4\pi}{3}$ $\quad \frac{9\pi}{6} = \frac{3\pi}{2}$ $\quad \frac{10\pi}{6} = \frac{5\pi}{3}$ $\quad \frac{11\pi}{6}$

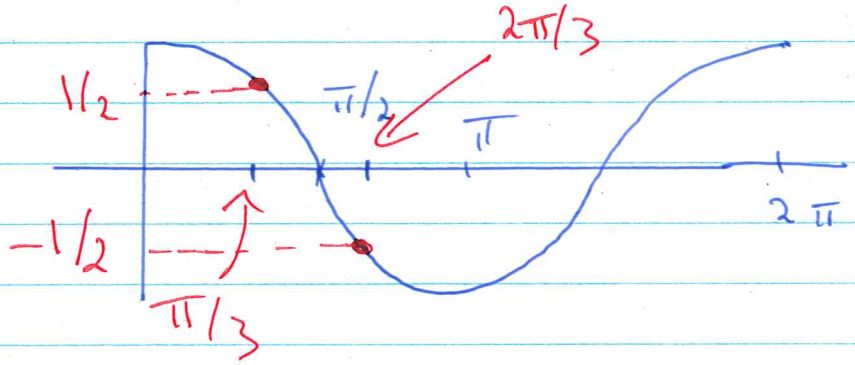


Last class we wanted to find

$$\cos\left(\frac{2\pi}{3}\right).$$



$$\cos\left(\frac{2\pi}{3}\right) = -\cos\left(\pi/3\right) = -1/2.$$



Example: Find x in $[0, 2\pi)$ satisfying:

$$2\sin x\cos x + \cos x = 0.$$

$$(\cos x)(2\sin x + 1) = 0.$$

$$\Rightarrow \quad \cos x = 0 \quad \text{or} \quad 2\sin x + 1 = 0$$

(5)

aside:

$$yx + x = 0.$$

$$x(y+1) = 0$$

$$x = 0, \quad y = -1.$$

When does $\cos x = 0$?

$$x = \pi/2, \ 3\pi/2.$$

When does $2\sin x + 1 = 0$,

$$2\sin x = -1$$

$$\sin x = -1/2.$$

So, $x = \frac{7\pi}{6}, \ 11\pi/6.$

$\Rightarrow$ $x = \pi/2, \ 3\pi/2, \ 7\pi/6, \ 11\pi/6.$

Example: Find values in $[0, 2\pi)$ where

$$2\cos x \sin x + \sqrt{3}\cos x = 0.$$

$$\cos x\left(2\sin x + \sqrt{3}\right) = 0.$$

$\Rightarrow$ $\cos x = x$

$\Rightarrow$ $x = \pi/2, \ \frac{3\pi}{2}$

$$2\sin x + \sqrt{3} = 0.$$

$$\sin x = \frac{-\sqrt{3}}{2}.$$

$$x = \frac{4\pi}{3}, \ \frac{5\pi}{3}.$$