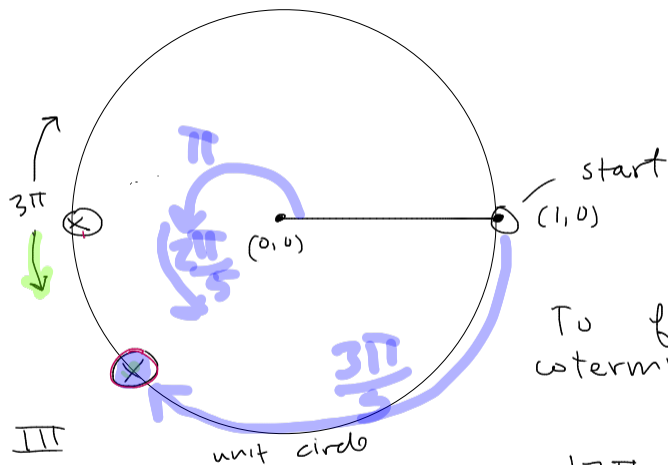


Thursday - Week 9

Coterminal angles: two angles that have the same terminal point

Terminal Point of an angle: coordinate pair (a point on Cartesian Plane) corresponding to the angle (angle wraps around the unit circle some # of times then stops.)



Ex $\frac{17\pi}{5} \approx 10.6$ radians

(radian = unit of length around the unit circle. 2π radians makes full circuit) (≈ 6.28 radians make full rotation)

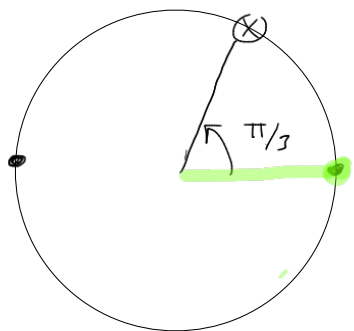
To find the angle in $[0, 2\pi)$ coterminal w/ $\frac{17\pi}{5}$...

$$\begin{aligned} \frac{17\pi}{5} &= \frac{15\pi}{5} + \frac{2\pi}{5} & \left| & \frac{17\pi}{5} = \frac{20\pi}{5} - \frac{3\pi}{5} \\ & 3\pi + \frac{2\pi}{5} & & = 4\pi - \frac{3\pi}{5} \\ & & & \\ & & & = \pi + \frac{2\pi}{5} \end{aligned}$$

Ex $\theta = \frac{-11\pi}{3}$

what angle in $[0, 2\pi)$ is co-terminal w/ θ ?

you have to choose



$$-\frac{11\pi}{3} = -\frac{12\pi}{3} + \frac{\pi}{3}$$

$$= -4\pi + \frac{\pi}{3}$$

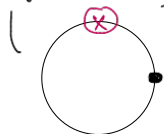
ans: $\frac{\pi}{3}$

Ex $\frac{77\pi}{2} = \theta$

$$\frac{77\pi}{2} = \frac{76\pi}{2} + \frac{\pi}{2}$$

$$= 38\pi + \frac{\pi}{2}$$

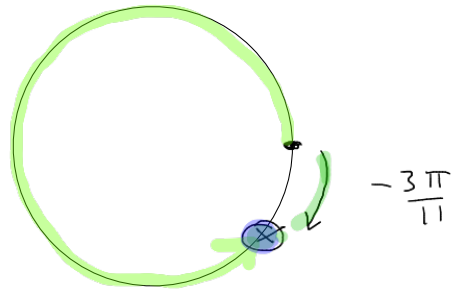
(even mult $\uparrow \pi$)



ans b/w $\frac{\pi}{2} =$ distance from usual start (1,0)

Ex. $\theta = \frac{19\pi}{11}$ is coterminal with: _____ in $[0, 2\pi)$

$$\begin{aligned}\frac{19\pi}{11} &= \frac{22\pi}{11} - \frac{3\pi}{11} \\ &= 2\pi - \frac{3\pi}{11}\end{aligned}$$



Ex. $\theta = \frac{41\pi}{11}$ is coterminal w/ _____ in $[0, 2\pi)$

$$\begin{aligned}\frac{41\pi}{11} &= \frac{44\pi}{11} - \frac{3\pi}{11} \\ &= 4\pi - \frac{3\pi}{11}\end{aligned}$$

$\therefore 2\pi - \frac{3\pi}{11} = \frac{19\pi}{11}$ is the angle we seek

Set # 7:

If you know $\sin(t) = .4$

and t is an angle lying in Quadrant III

$\sin^2 t + \cos^2 t = 1$

$(.4)^2 + \cos^2 t = 1$

$\cos^2 t = 1 - .16 = .84$

neg. in QIII

$\cos(t) = -\sqrt{.84}$

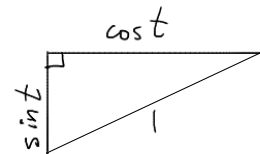
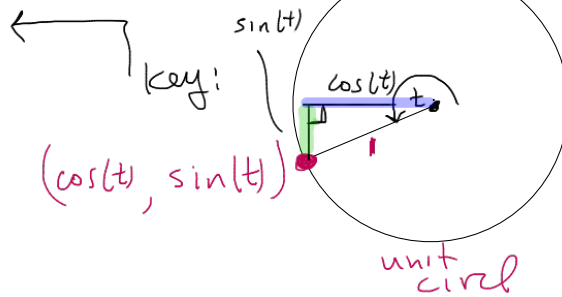
$\tan(t) = \frac{\sin t}{\cos t} = \frac{.4}{-\sqrt{.84}}$

$\frac{1}{\cos t} = \sec(t) = -\frac{1}{\sqrt{.84}}$

$\frac{1}{\sin t} = \csc(t) = \frac{1}{.4}$

$\cot(t) = \frac{-\sqrt{.84}}{.4}$

$\cot(t) = \frac{\cos}{\sin} \text{ or } \frac{1}{\tan}$



Pythas thm
 $\Rightarrow \sin^2 t + \cos^2 t = 1$

Set 7:

(quadratic-type trig equations)

Ex 1 $x^2 - 5x - 6 = 0$

$$(x-6)(x+1) = 0$$

$$x=6$$

$$x=-1$$

Ex $\cos^2(x) - 5\cos(x) - 6 = 0$

1st: realize $\cos^2(x) = (\cos(x))^2$

$$(\cos(x) - 6)(\cos(x) + 1) = 0$$

$$\cos(x) = 6$$

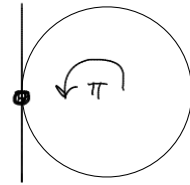
no sol'n b/c

$$\cos(x) = -1$$

$$\begin{aligned} \max(\cos(x)) &= 1 \\ \min(\cos(x)) &= -1 \end{aligned}$$

$$x = \pi + 2\pi k = (2k+1)\pi$$

odd mults
of π .



where are x -coords = -1