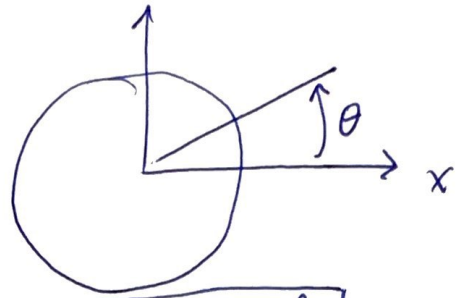


CHPT 5 : Trig Functions

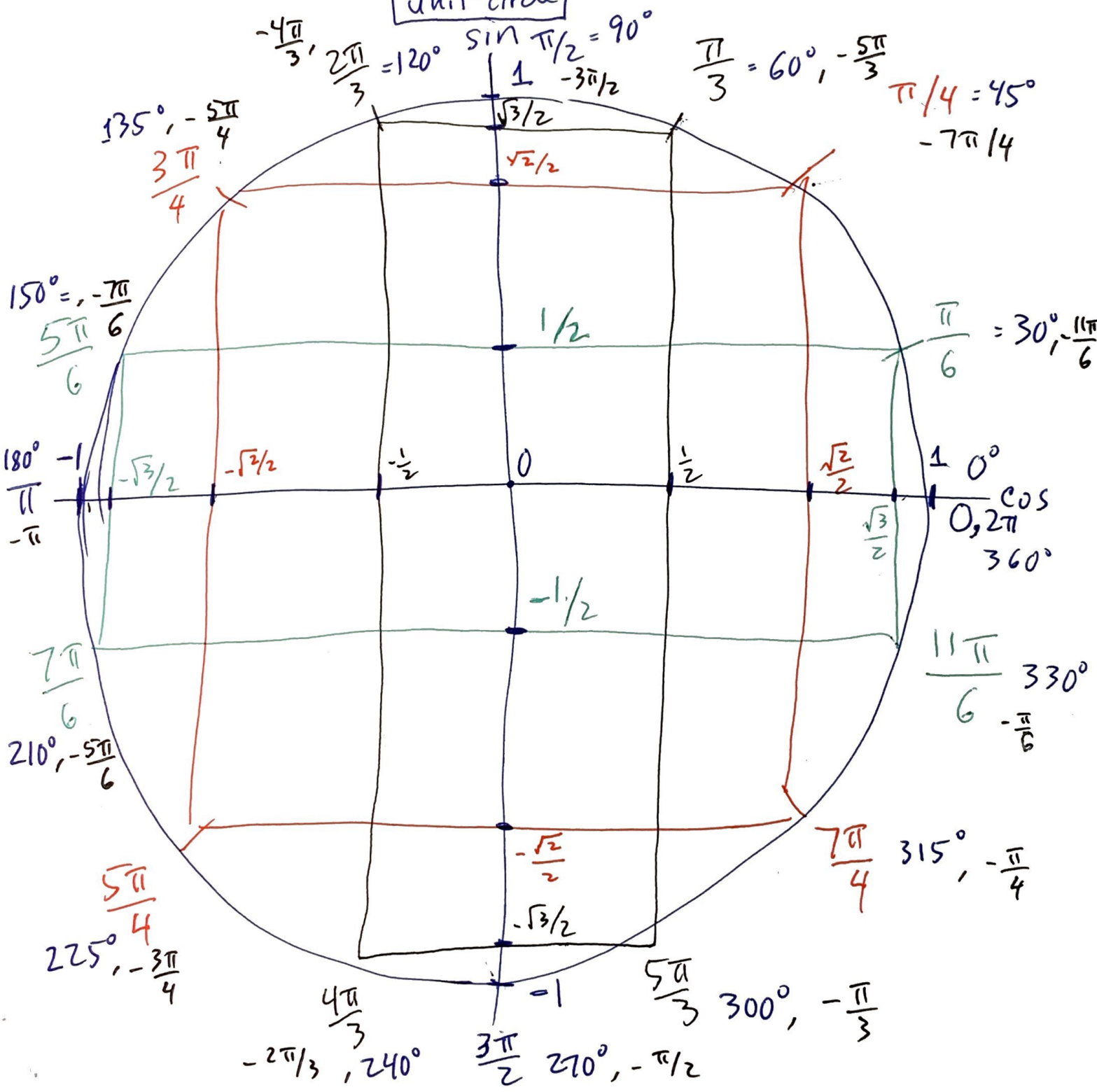
Review only

①

* Angles

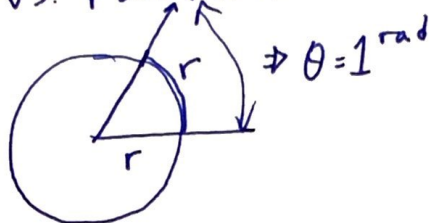


unit circle



(2)

* degrees vs. radians

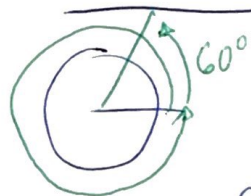
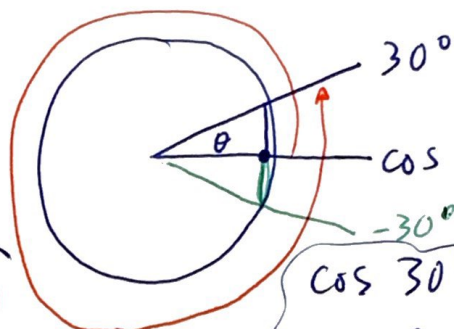


$$2\pi^{\text{r}} = 360^{\circ}$$

$$\pi^{\text{r}} = 180^{\circ}$$

* coterminal angles

[EX] Find an $\angle$ coterminal with 420° but is between 0° and 360°



$$360^{\circ} + 60^{\circ} = 420^{\circ}$$

so answer is 60°

$$\cos(-30^{\circ})$$

$$= \cos(-30^{\circ} - 360^{\circ})$$

$$= \cos(-30^{\circ} - n \cdot 360^{\circ})$$

(-) family

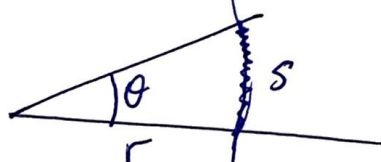
$$\cos 30^{\circ}$$

$$= \cos(30^{\circ} + 360^{\circ})$$

$$= \cos(30^{\circ} + n \cdot 360^{\circ})$$

(+) family

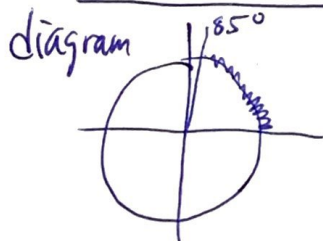
* arc length



$$s = r\theta \text{ if}$$

θ is in radians

[EX] What is the length of an arc of a circle of radius 7m that subtends 85° ?



formula

$$s = r\theta$$

$$= (7\text{m})(85^{\circ})\left(\frac{\pi^{\text{r}}}{180^{\circ}}\right)$$

$$= \underline{\underline{10.4\text{m}}}$$

* unit circle : Read off the cos or sin axis (3)
 from the unit circle

$$\bullet \sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}$$

$$\bullet \cos \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

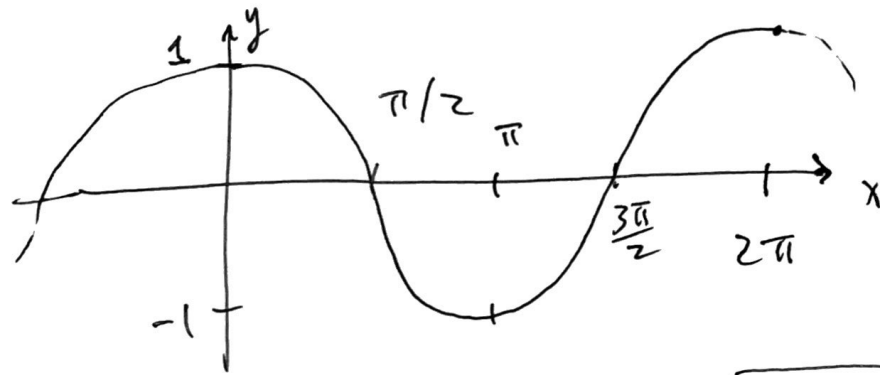
$$\bullet \sin\left(-\frac{5\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

* Domain & Range

$$y = \cos x$$

$$D_{\cos} : \{x \mid x \in \mathbb{R}\}$$

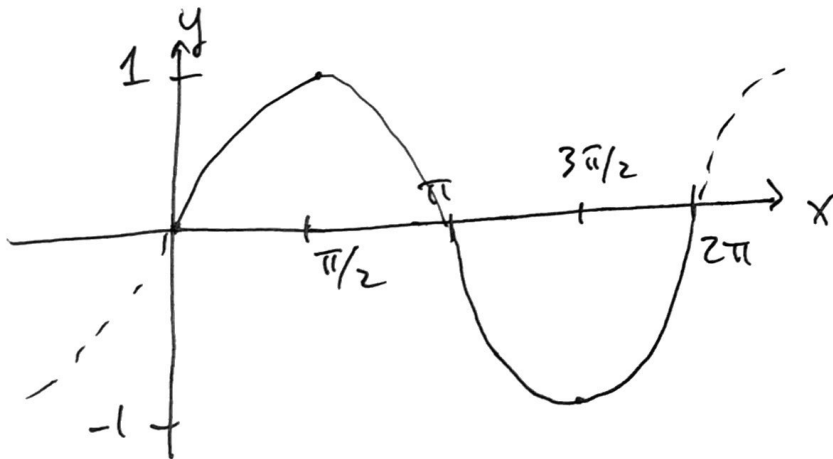
$$R_{\cos} : \{y \mid -1 \leq y \leq 1\}$$



$$y = \sin x$$

$$D_{\sin} : \{x \mid x \in \mathbb{R}\}$$

$$R_{\sin} : \{y \mid -1 \leq y \leq 1\}$$



* the other trig functions

(4)

$$\tan x \equiv \frac{\sin x}{\cos x}, \quad \cot x \equiv \frac{\cos x}{\sin x}$$

$$\sec x \equiv \frac{1}{\cos x}, \quad \csc x \equiv \frac{1}{\sin x}$$

"defining"

EX $\tan \pi/4 = \frac{\sin \pi/4}{\cos \pi/4} = \frac{\sqrt{2}/2}{\sqrt{2}/2} = 1$

$$\tan \pi/3 = \frac{\sin \pi/3}{\cos \pi/3} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$$

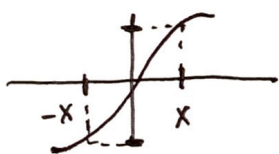
$$\csc \frac{\pi}{6} = \frac{1}{\sin \pi/6} = \frac{1}{1/2} = 2$$

* "oddness"



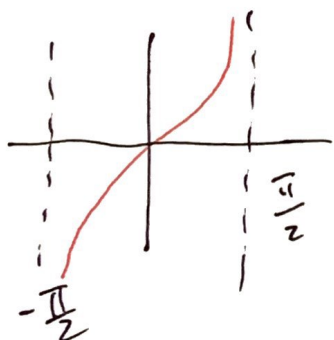
$$\cos(-x) = \cos(x)$$

"even function"



$$\sin(-x) = -\sin(x)$$

"odd function"



$$\tan(-x) = \frac{\sin(-x)}{\cos(-x)} = \frac{-\sin(x)}{\cos(x)} = -\tan(x) \quad \text{"odd"}$$

$$\sec(-x) = \sec(x)$$

$$\csc(-x) = -\csc(x)$$

$$\tan(-x) = -\tan(x)$$

$$\cot(-x) = -\cot(x)$$