

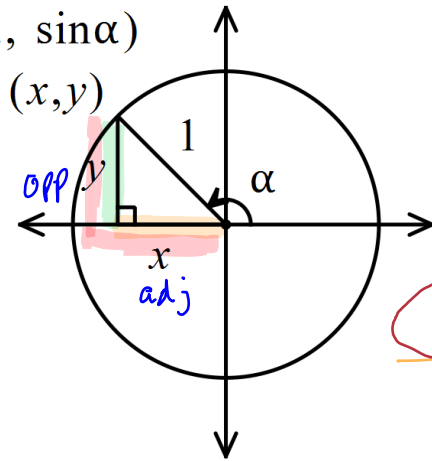
9.2

Date: 3/21/24

Objective: I can find trig functions for coterminal angles.

REVIEW

$(\cos \alpha, \sin \alpha)$



$$\sin \alpha = y$$

$$\cos \alpha = x$$

$$\tan \alpha = \frac{y}{x}$$

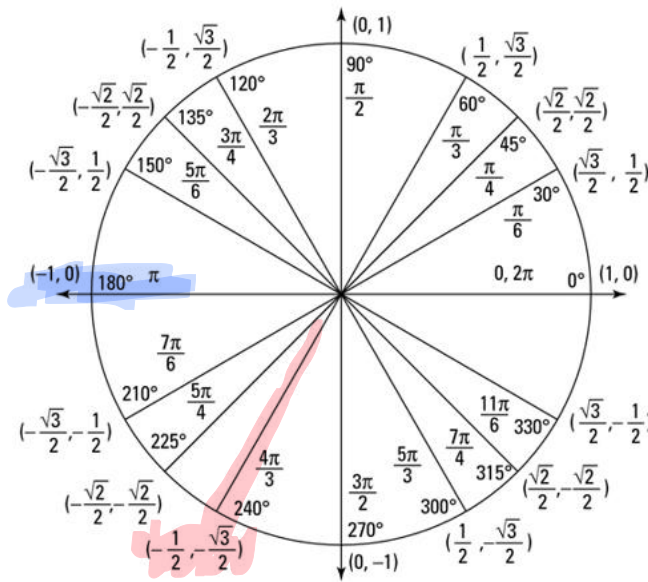
$$\csc \alpha = \frac{1}{y}$$

$$\sec \alpha = \frac{1}{x}$$

$$\cot \alpha = \frac{x}{y}$$

do reciprocal of fraction

$$1 \div \frac{1}{2} = 1 \cdot \frac{2}{1} = 2$$



Find the angle in degrees $[0^\circ, 360^\circ)$ and radians $[0, 2\pi)$ on the unit circle that matches the given ordered pair. Then find all 6 trigonometric ratios for the found angle.

1. $(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$

$$\theta = 240^\circ, \frac{4\pi}{3}$$

$$\sin \theta = -\frac{\sqrt{3}}{2}$$

$$\cos \theta = -\frac{1}{2}$$

$$\tan \theta = \sqrt{3}$$

$$\csc \theta = -\frac{2}{\sqrt{3}}$$

$$\sec \theta = -2$$

$$\cot \theta = \frac{1}{\sqrt{3}}$$

2. $(-1, 0)$

$$\theta = 180^\circ, \pi$$

$$\sin \theta = 0$$

$$\cos \theta = -1$$

$$\tan \theta = 0$$

$$\csc \theta = \text{undef}$$

$$\sec \theta = -1$$

$$\cot \theta = \text{undef}$$

3. $(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$

$$\theta = 315^\circ, \frac{7\pi}{4}$$

$$\sin \theta = -\frac{\sqrt{2}}{2}$$

$$\cos \theta = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$$

$$\tan \theta = -1$$

$$\csc \theta = -\frac{2}{\sqrt{2}} \text{ or } -\sqrt{2}$$

$$\sec \theta = \frac{2}{\sqrt{2}} = \sqrt{2}$$

$$\cot \theta = -1$$

1. What is a coterminal angle? *same starting & stopping point*

2. How do you find a coterminal angle for a degree?

$$\pm 360^\circ$$

3. How do you find a coterminal angle for a radian?

$$\pm 2\pi$$

4. What is a coterminal angle for 225° ?

$$585^\circ, -135^\circ$$

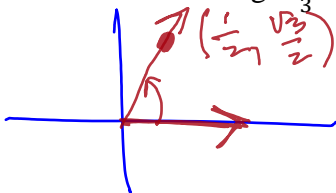
5. What is a coterminal angle for $-\frac{\pi}{6}$?

$$\frac{11\pi}{6}, -\frac{13\pi}{6}$$

6. Are $\frac{\pi}{3}$ and $\frac{7\pi}{3}$ coterminal angles?

$$\frac{\pi}{3} + \frac{6\pi}{3} = \frac{7\pi}{3}$$

7a. Sketch the angle $\frac{\pi}{3}$.



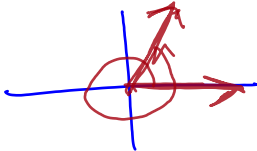
7b. What is the ordered pair for $\frac{\pi}{3}$?

$$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$

7c. Find cosine of $\frac{\pi}{3}$?

$$\frac{1}{2}$$

8a. Sketch the angle $\frac{7\pi}{3}$.

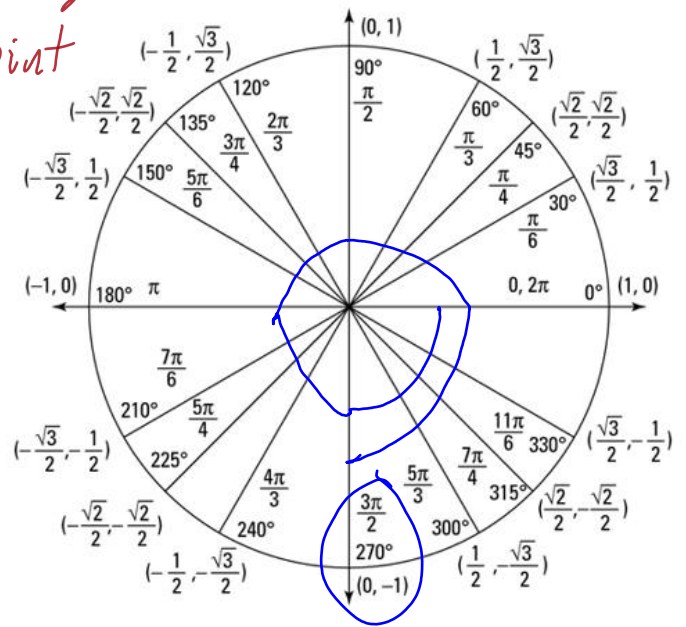


8b. What is the ordered pair for $\frac{7\pi}{3}$?

$$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$$

8c. Find cosine of $\frac{7\pi}{3}$?

$$\frac{1}{2}$$



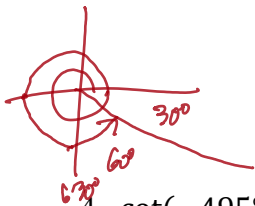
Notice they have the same cosine. Coterminal angles have the same trigonometric ratios.

Find the exact value (ratio) of each trigonometric function using the Unit Circle as a reference.

1. $\sin 690^\circ = -\frac{1}{2}$

2. $\tan \frac{17\pi}{6} = -\frac{1}{\sqrt{3}}$

3. $\sec\left(-\frac{5\pi}{2}\right) = \text{undefined}$



4. $\cot(-495^\circ)$

5. $\cos 7\pi$

6. $\csc\left(-\frac{8\pi}{3}\right)$