Starter: Use your knowledge of the unit circle to...

Find the radians of the following degrees...

$-45°$ $315°$ $240°$

Find the degrees of the following radians...

$\frac{\pi}{4}$ $\frac{7\pi}{6}$ $-\frac{5\pi}{3}$

6-2 Angles and Radians

Objectives:

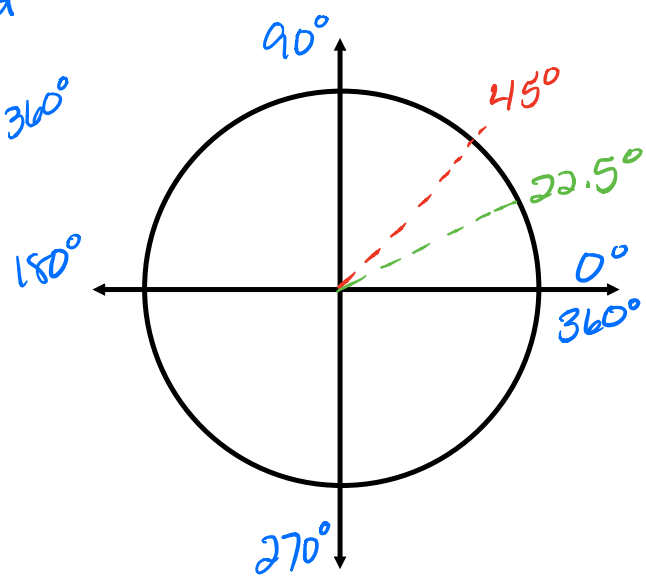
6-2a: I can draw angles in radians.

6-2b: I can find co-terminal angles in degrees & radians.

6-2c: I can find reference angles in radians.

How do I find 22.5 degrees on the circle below?

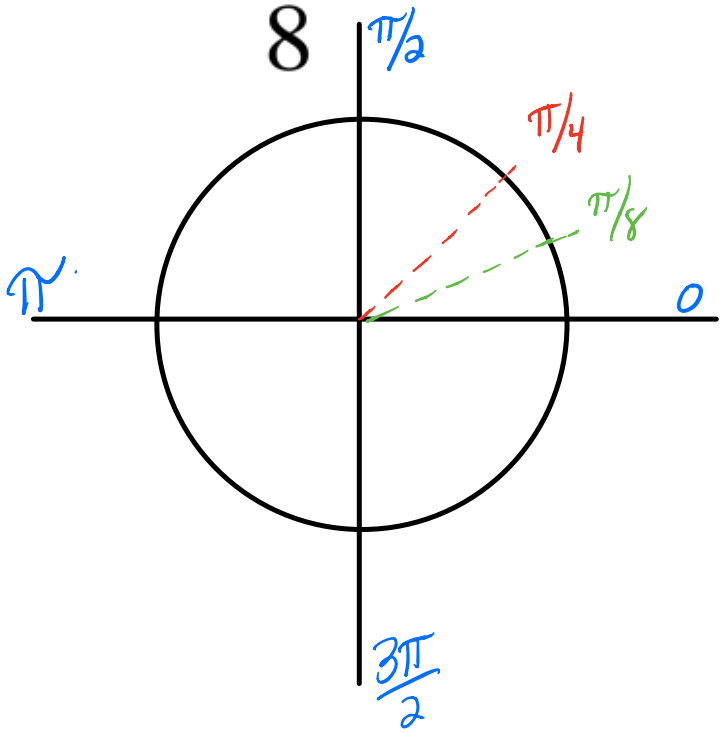
This is what I know... $0°, 90°, 180°, 270°, 360°$



I also know if I split 90° in half I get 45°

And if I split 45° in half I get 22.5°

How do I find $\frac{\pi}{8}$ radians on the circle below

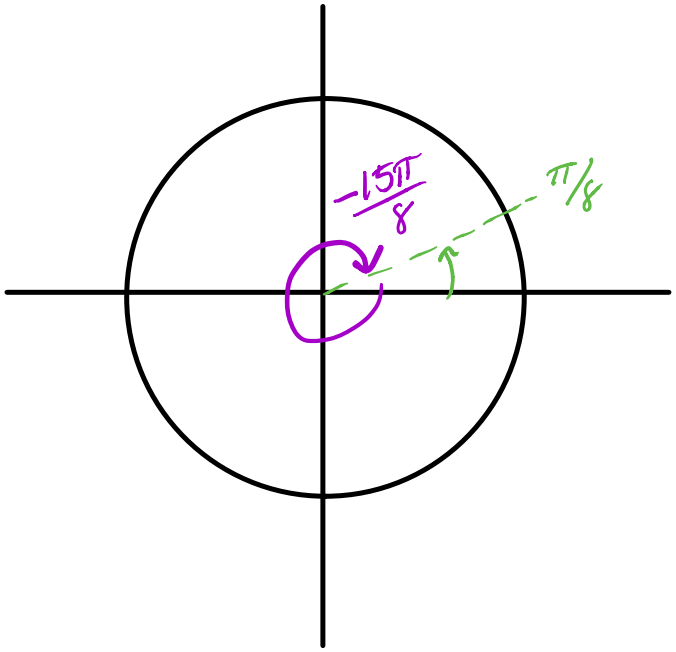


What I know ...

I also know if I split π/2 in half ... I get π/4

And if I split π/4 in half ... I get π/8

Can I find an angle co-terminal to $\frac{\pi}{8}$?



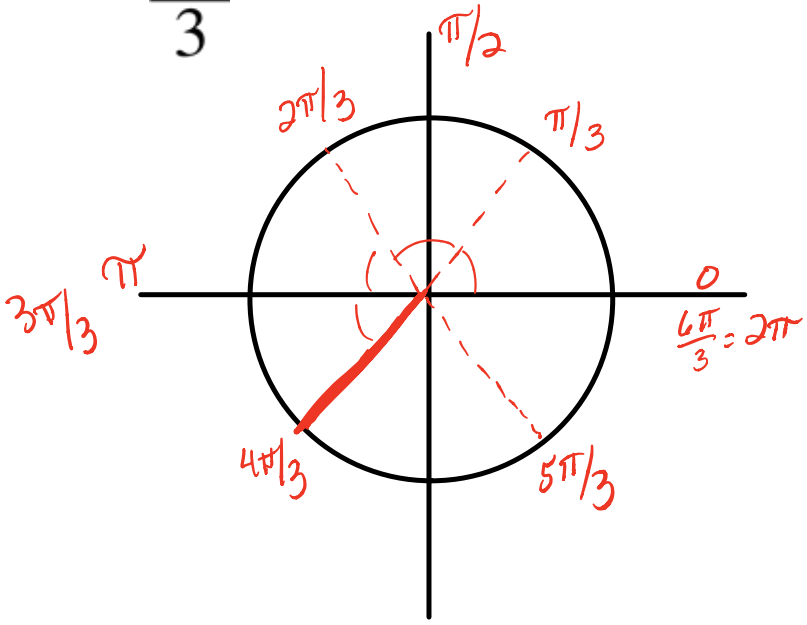
the coterminal angle is

$\frac{\pi}{8} - 2\pi$

(remember to get a common denominator)

$\frac{\pi}{8} - \frac{16\pi}{8} = \frac{-15\pi}{8}$

Find $\frac{4\pi}{3}$ radians on the circle below



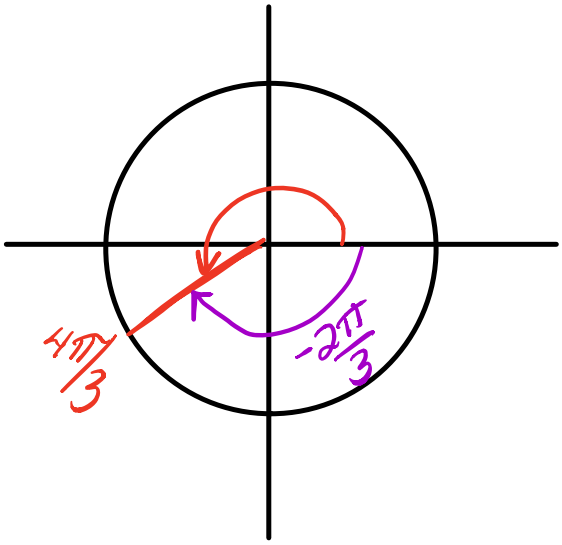
Split π into 3 equal parts...

Coterminal angle

$\frac{4\pi}{3} - 2\pi$ (find a common denominator)

$\frac{4\pi}{3} - \frac{6\pi}{3} = \frac{-2\pi}{3}$

Find an angle co-terminal to $\frac{4\pi}{3}$



What is the reference angle?

add 2π

For each angle, find the nearest positive coterminal angle and the nearest negative coterminal angle.

subtract 2π

$-\frac{\pi}{2}$ $\quad \frac{-\pi}{2}+2\pi=\frac{-\pi}{2}+\frac{4\pi}{2}=\frac{3\pi}{2}$ $\quad \frac{-\pi}{2}-2\pi=\frac{-\pi}{2}-\frac{4\pi}{2}=\frac{-5\pi}{2}$

$\frac{11\pi}{6}$ $\quad \frac{11\pi}{6}+2\pi=\frac{11\pi}{6}+\frac{12\pi}{6}=\frac{23\pi}{6}$ $\quad \frac{11\pi}{6}-2\pi=\frac{11\pi}{6}-\frac{12\pi}{6}=-\frac{\pi}{6}$

$\frac{2\pi}{3}$ $\quad \frac{2\pi}{3}+2\pi=\frac{2\pi}{3}+\frac{6\pi}{3}=\frac{8\pi}{3}$ $\quad \frac{2\pi}{3}-2\pi=\frac{2\pi}{3}-\frac{6\pi}{3}=\frac{-4\pi}{3}$

$-\frac{\pi}{4}$ $\quad \frac{-\pi}{4}+2\pi=-\frac{\pi}{4}+\frac{8\pi}{4}=\frac{7\pi}{4}$ $\quad \frac{-\pi}{4}-2\pi=\frac{-\pi}{4}-\frac{8\pi}{4}=\frac{-9\pi}{4}$

To convert degrees into radians - multiply the degrees by $\frac{\pi}{180^\circ}$

To convert radians into degrees - multiply the radians by $\frac{180^\circ}{\pi}$

Convert the following angles, in degrees, to radians.

A. $20^\circ \cdot \frac{\pi}{180^\circ} = \frac{20\pi}{180} = \frac{\pi}{9}$

B. $\frac{9\pi}{2} \cdot \frac{180^\circ}{\pi} = \frac{9(180^\circ)}{2} =$

$\frac{1620}{2} = 810^\circ$

C. $-\frac{7\pi}{12} \cdot \frac{180^\circ}{\pi} = \frac{-7(180)}{12} = \frac{-1260^\circ}{12}$

-105°

D. $-60^\circ \cdot \frac{\pi}{180} = \frac{-60\pi}{180} = \frac{-\pi}{3}$

You TRY...Convert the following angles, in degrees to radians or radians to degrees...

315°

$\frac{5\pi}{6}$

$$* \quad 315^\circ \cdot \frac{\pi}{180} = \frac{315\pi}{180} = \frac{7\pi}{4}$$

$$\frac{5\pi}{6} \cdot \frac{180^\circ}{\pi} = \frac{5(180^\circ)}{6} = \frac{900^\circ}{6} = 150^\circ$$