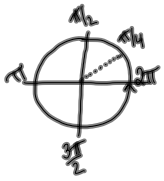
Chapter 4: Trigonometry and the Unit Circle

Section 4.1: Angles and Angle Measure

Angles can be measured using different units: revolutions, degrees, radians and gradians.

radian = one radian is the measure of a central angle subtended in a circle by an arc equal in length to the radius of the circle.

Degrees	Radians
$360°$	2π
$180°$	π
$90°$	$\frac{\pi}{2}$
$45°$	$\frac{\pi}{4}$



Converting from Degrees to radians

1) $270° \times \frac{\pi}{180°} = \frac{270\pi}{180} = \frac{3\pi}{2}$

2) $120° \times \frac{\pi}{180} = \frac{120\pi}{180} = \frac{2\pi}{3}$

3) $225°\left(\frac{\pi}{180}\right) = \frac{225°\pi}{180°} = \frac{5\pi}{4}$

Converting from radians to degrees.

1) $\frac{3\pi}{4}\left(\frac{180}{\pi}\right) = \frac{3(180)}{4} = 135°$

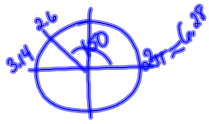
2) $\frac{5\pi}{6} = 150°$

3) 2.57

$2.57\left(\frac{180}{\pi}\right)$

$x \approx 147.25°$

$\frac{5\pi}{6} \approx 2.6$



* If you are given the decimal radian measure, use π as 3.14.

Question:

Convert $\frac{7\pi}{3}$ as a radian measure in decimal form.

Calculator $\frac{7\pi}{3} \approx 7.33$

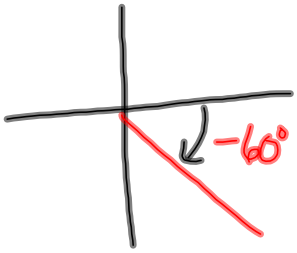
$\frac{7\pi}{3}$ in degrees $420°$

Coterminal Angles

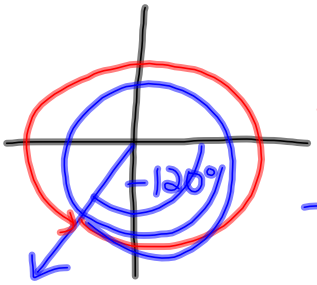
angles in standard position with the same terminal arm.

$60° + 360°$
$= 420°$

Negative Angles



Given the angle, $-120°$.
Sketch the angle and give one positive coterminal angle and one negative coterminal.



$-120° + 360° = 240°$

$-120° - 360° = -480°$

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