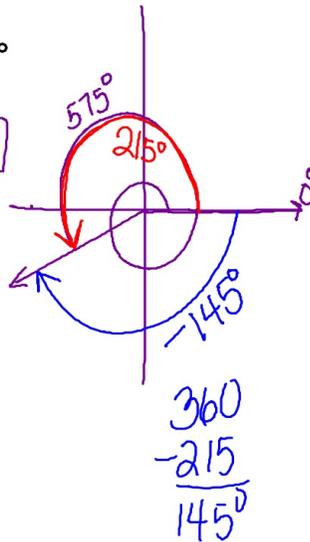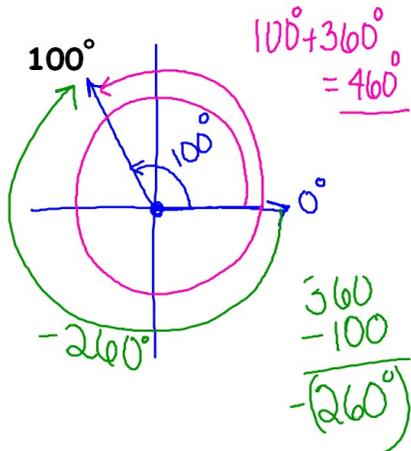**Angles in Standard Position**

counter-
+ clockwise

− clockwise

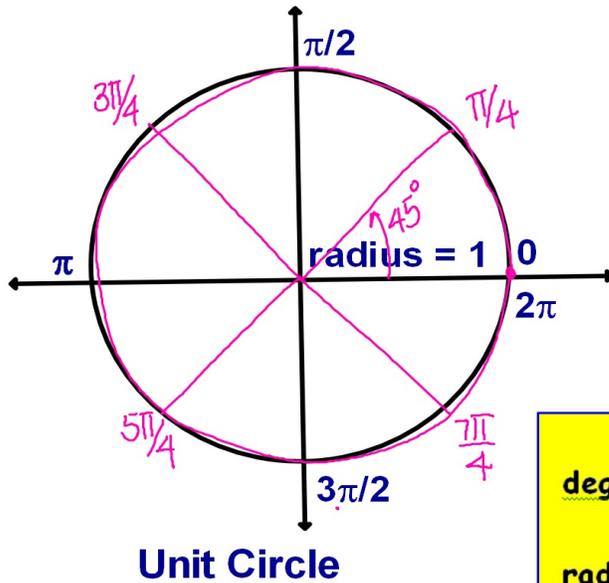Two angles in standard position are *coterminal* if their terminal sides coincide.

1 Draw an angle in standard position. Find one positive angle and one negative angle that are coterminal with the given angle.

$100°$

$100° + 360°$
$= 460°$

$-260°$

360
-100
$-(260°)$

$575°$

-360
$215°$

$-145°$

360
-215
$145°$

$-80°$

360
-80
$280°$

$280°$

$-440°$

$-80°$

$270°$
$-90°$
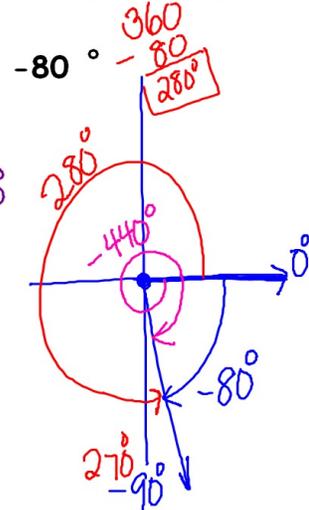
Angles can also be measured in *radians* .

π/2

3π/4   π/4

45°

π   radius = 1 0

2π

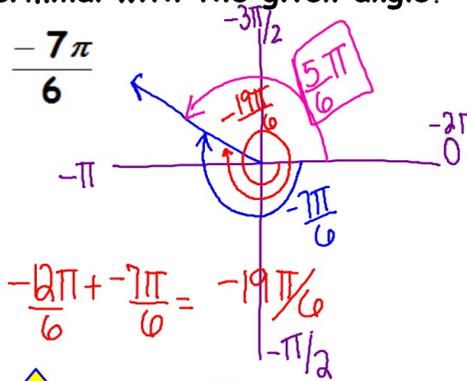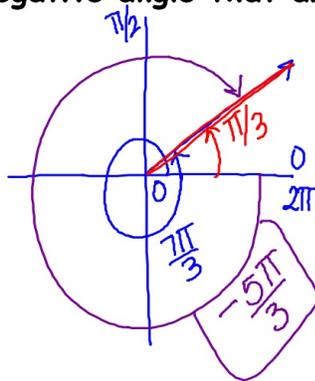5π/4   7π/4

3π/2

Unit Circle

$2\pi = 360°$

$\pi = 180°$

degrees to radians: multiply by $\dfrac{\pi}{180°}$

radians to degrees: multiply by $\dfrac{180°}{\pi}$

2 Draw the angle in standard position. Find one positive and one negative angle that are coterminal with the given angle.

$2\frac{1}{3}\pi = \dfrac{7\pi}{3}$

$\boxed{\dfrac{\pi}{3}}$

π/2

π/3

0   2π

π/3

$\boxed{-\dfrac{5\pi}{3}}$

$-\dfrac{7\pi}{6}$

$\boxed{\dfrac{5\pi}{6}}$

-3π/2

-19π/6

-2π   0

-π

-π/6

$\dfrac{-12\pi}{6} + \dfrac{-7\pi}{6} = \dfrac{-19\pi}{6}$

-π/2

3 Convert $-220°$ to radians.

$-220 \cdot \dfrac{\pi}{180°} = \dfrac{-11\pi}{9}$

4 Convert $\dfrac{5\pi}{12}$ to degrees.

$\dfrac{5\pi}{12} \cdot \dfrac{180}{\pi} = 75°$

30
2