

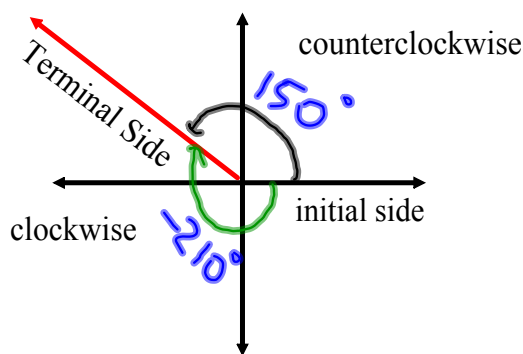
13.2- Angles of Rotation

In trigonometry an angle is defined by a ray that is rotated around its endpoint. Each position of the rotated ray, relative to its starting point, creates an **angle of rotation**. The greek letter *theta*, θ , is commonly used to name an angle of rotation.

The initial position of the ray is called the **initial side** of the angle, and the final position is called the **terminal side** of the angle. When the initial side lies along the positive x -axis and its endpoint is at the origin, the angle is said to be in **standard position**.

If the direction of rotation is counterclockwise, the angle has a **positive measure**. If the direction of rotation is clockwise, the angle has a **negative measure**.

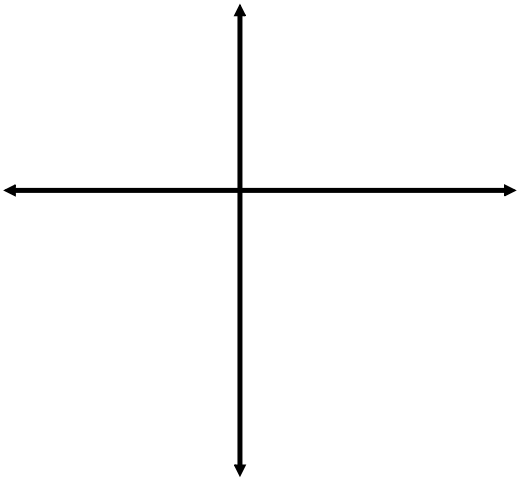
The most common unit for angle measure is the **degree**. A complete rotation of a ray is assigned a measure of 360° . Thus, a measure of 1° is $1/360$ of a complete rotation.



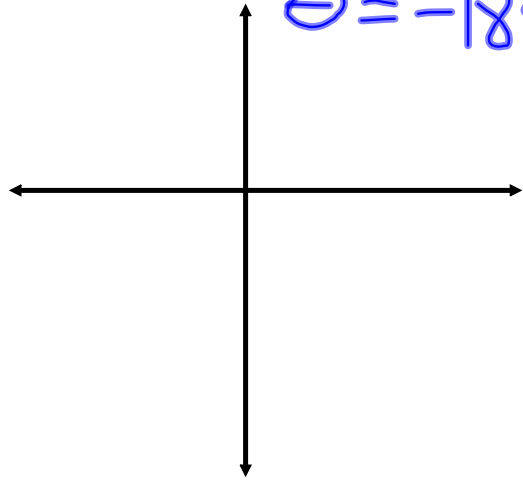
A record player makes 33.3 revolutions in 1 minute. Find the number of degrees through which a point on the record rotates in 1 second.

Coterminal Angles

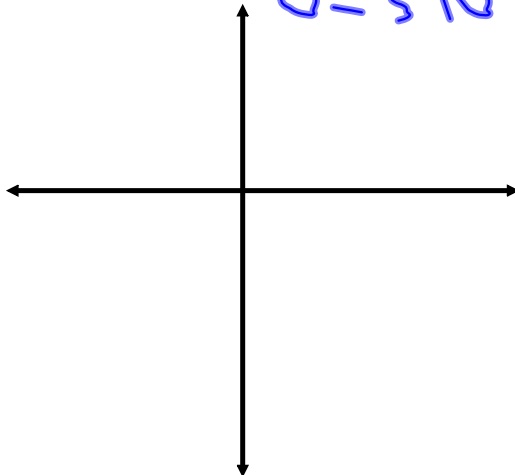
$$\theta = 123^\circ$$



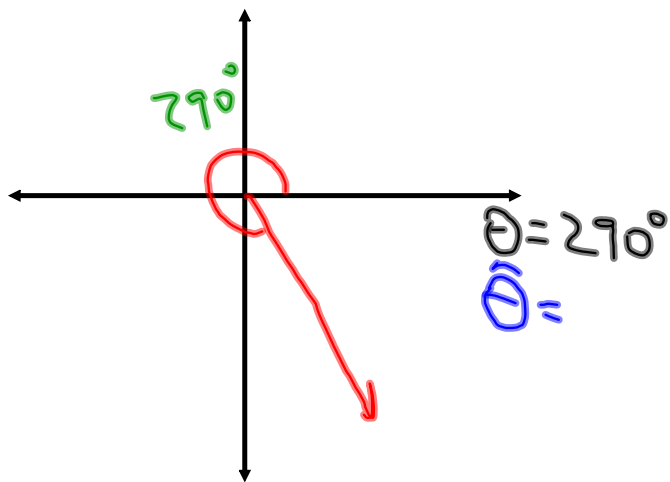
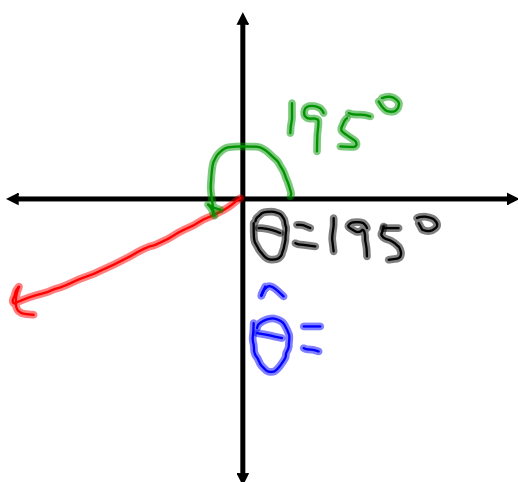
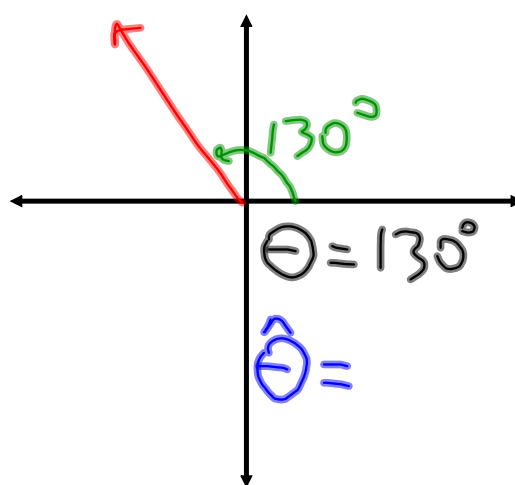
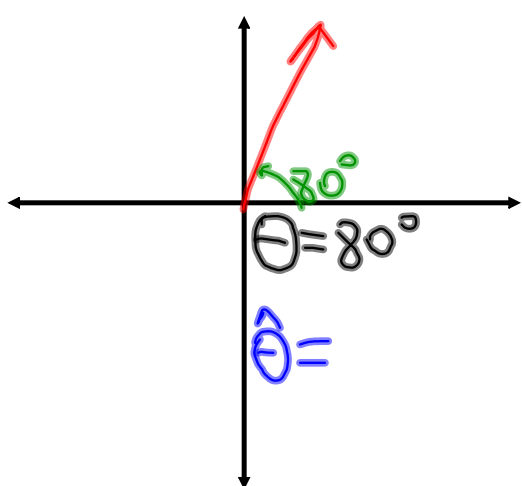
$$\theta = -185^\circ$$



$$\theta = 390^\circ$$



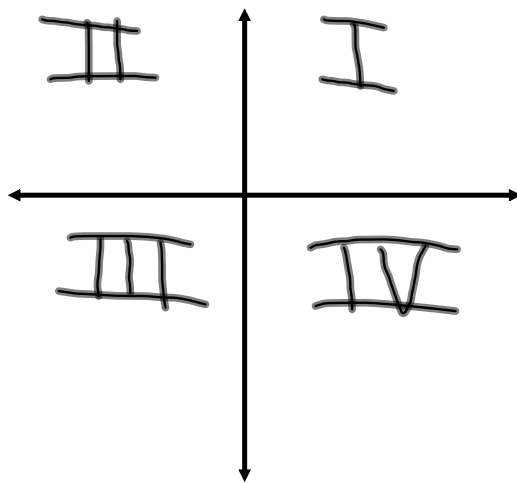
Reference Angles



Reference Angles

For θ in Quadrant	I	II	III	IV
	$\hat{\theta} = \theta$	$\hat{\theta} = 180^\circ - \theta$	$\hat{\theta} = \theta - 180^\circ$	$\hat{\theta} = 360^\circ - \theta$

$|0^\circ - 90^\circ|90^\circ - 180^\circ|180^\circ - 270^\circ|270^\circ - 360^\circ$



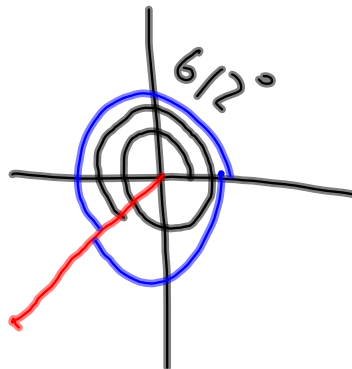
Homework

Pg. 841-842 #11-35 odd

17) 612°

Coterm.
 252°
 -108°

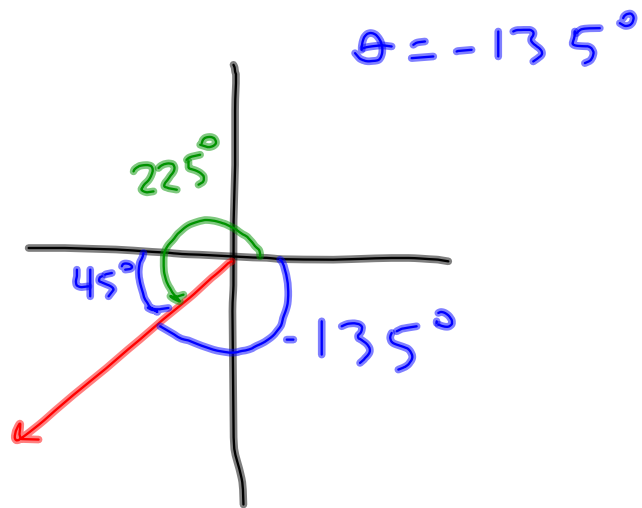
Reference
 72°



19)

Coterminal
 225°

$$\hat{\theta} = 45^\circ$$



$$23) -450^\circ$$

Coterminal

$$270^\circ$$

$$-90^\circ$$

$$\hat{\theta} = 90^\circ$$

