

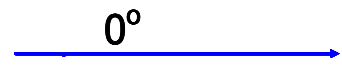
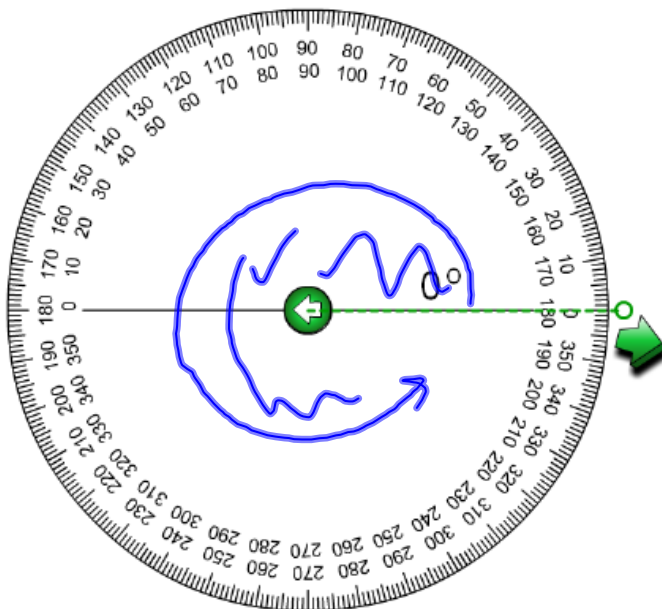
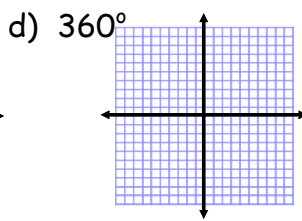
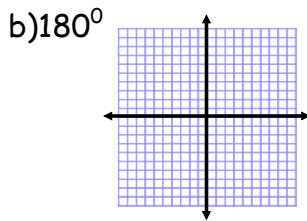
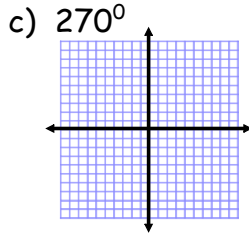
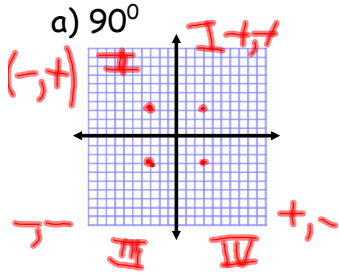
Lesson 54

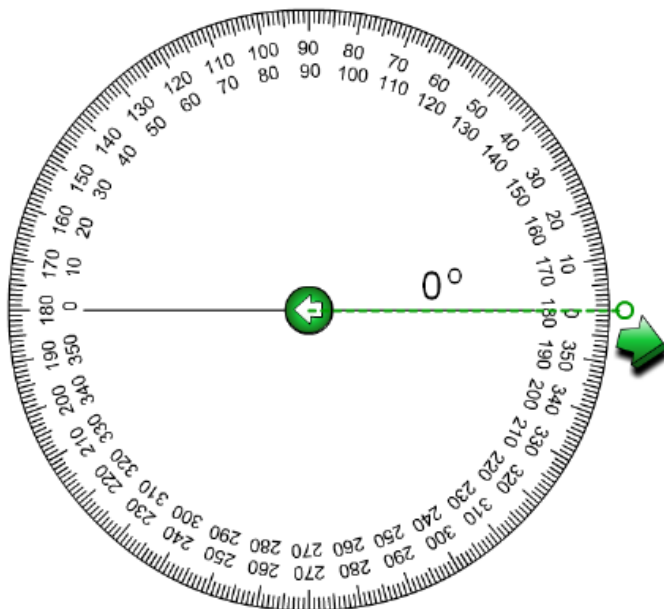
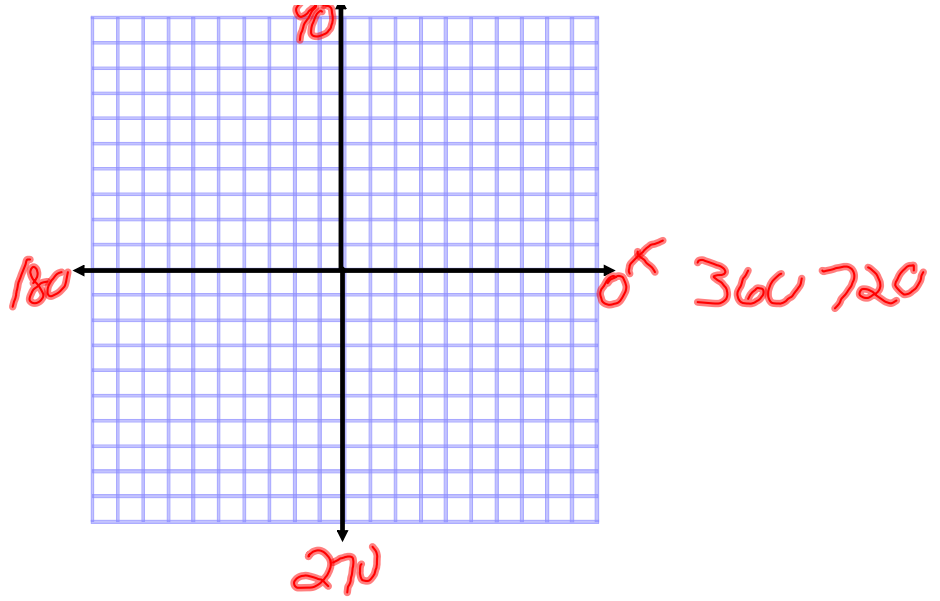
Aim: How do we look at angles as rotation?

HW: Ch 9 read pages 358 - 359
 Page 361 4,6, 7-17,18,20,23,25,32
 357 # 14,16

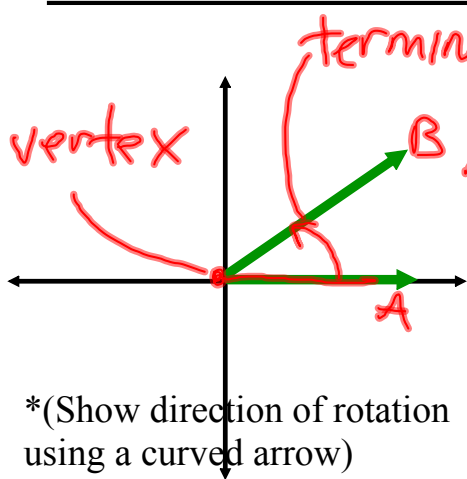
DO NOW:

Find the image of (3,3) after rotation of:





Standard Position



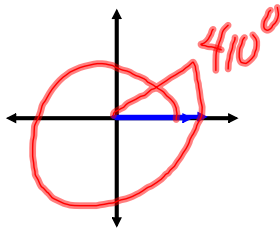
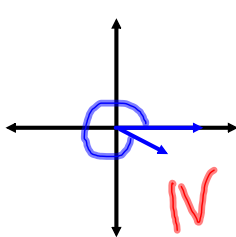
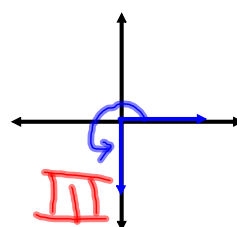
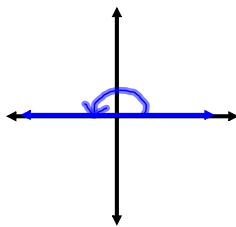
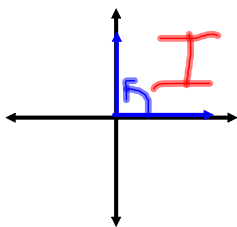
*(Show direction of rotation using a curved arrow)

The vertex is at the origin

The initial side remains fixed on the x-axis *Doesn't move*

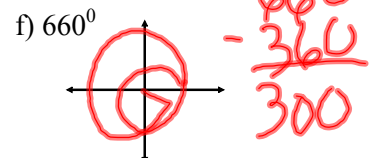
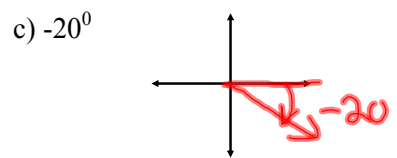
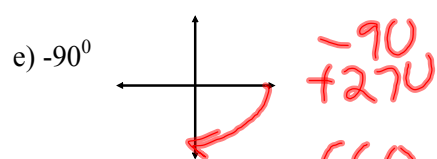
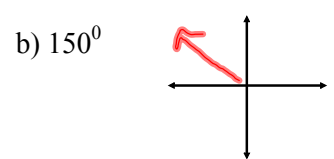
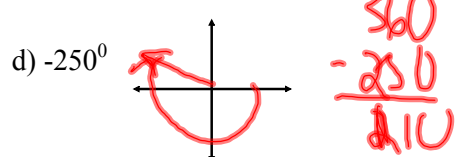
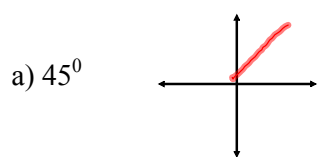
-The terminal side rotates *counter-clockwise for a positive rotation* (and clockwise for a negative rotation)

What is the angle of rotation for each?



These are
Quadrantal
Angles:
 $0^{\circ}, 90^{\circ}, 180^{\circ},$
 $270^{\circ}, 360^{\circ}$

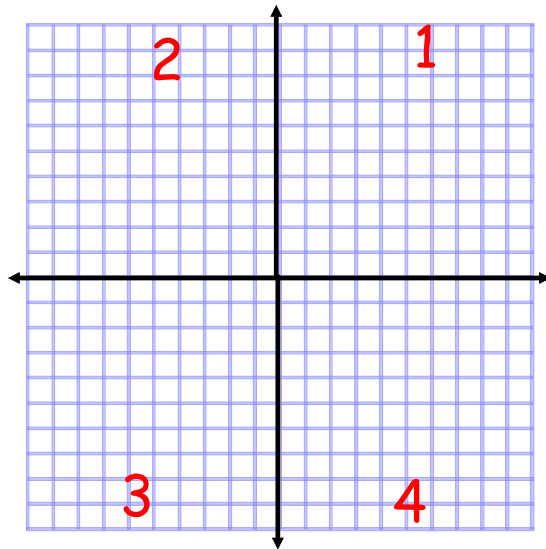
2) Draw each of the following angles in standard position:



Coterminal Angles:
 angles in standard position that have the same terminal side

Exs: -20° and are coterminal angles
 -90° and are coterminal "
 660° and are coterminal "

Quadrants



3) Which quadrant does each angle in #2 belong to?

a) 45° **1**

b) 150° **2**

c) -20° **4**

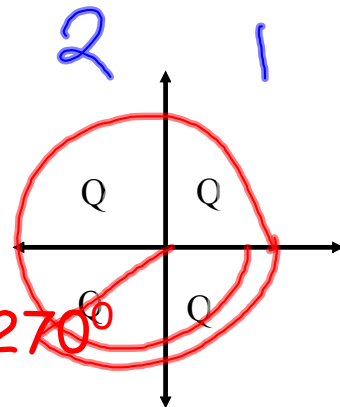
g) -500

d) -250°

$$\begin{array}{r} 360 \\ -250 \\ \hline +110 \end{array}$$

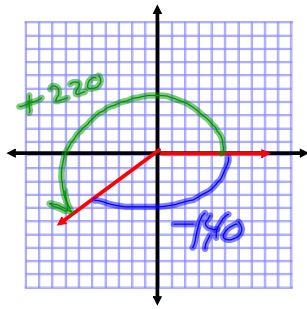
e) -90°

Quadrantal angle 270°



f) 660° $660 - 360 = 300$

Quadrant 4



Is this angle
counterclockwise
or clockwise ?

The angle could be
could be either
 220° or -140°

Angles that have the same terminal sides in a
standard position are COTERMINAL ANGLES.

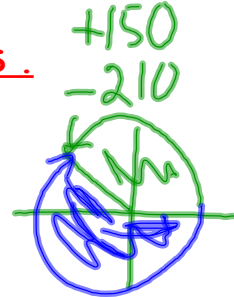
If 2 angles are coterminal the difference in
their measure is 360° .

$$220 - -140 = 360$$

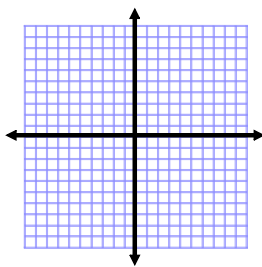
What is the coterminal angles of :

a) 150

b) - 80



If angle whose measure is greater than
 360 , how do we find the coterminal angle?



Divide the angle by 360
and the remainder is the
coterminal angle.

$$800 \div 360 = 2 \text{ remainder } 140$$

140 is coterminal with -220

$$\begin{array}{r}
 -950 \\
 -360 \\
 \hline
 -590 \\
 -360 \\
 \hline
 -230 \\
 +360 \\
 \hline
 130
 \end{array}$$

What about -950 ?



7) Determine which quadrant the angles are located:

a) 170°

b) 350°

c) -165°

d) $460^\circ = 100$

e) -210°

coterminal

$$-190$$

$$-10$$

$$195$$

$$-260$$

$$150$$

$$\begin{array}{r} 360 \\ 170 \\ \hline -190 \end{array}$$

$$\begin{array}{r} 460 \\ -360 \\ \hline 100 \end{array}$$

8) a) Draw 120° in standard position.

b) What quadrant is 120° in? 2

c) How do we find $\sin(120^\circ)$

$$\sin(120)$$

$$\sin 120 = \sin 60$$

$$\sin 60 = \frac{\sqrt{3}}{2}$$

