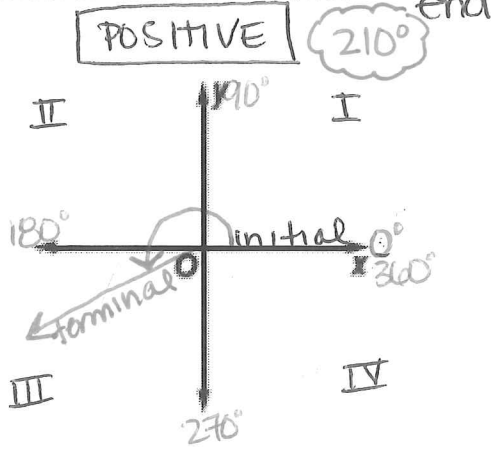
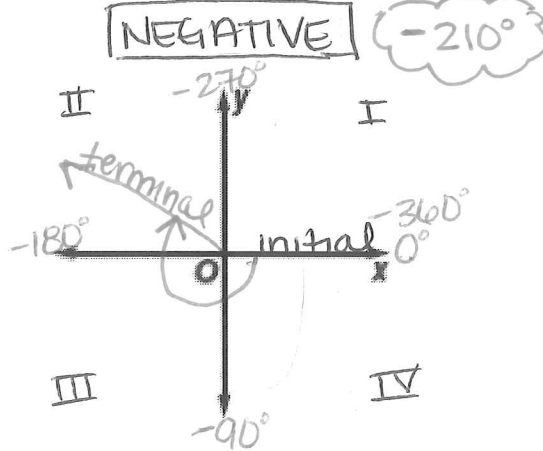


13-2 Notes, Angles and Angle Measurement

Angle Measurement An angle is determined by two rays. The degree measure of an angle is described by the amount and direction of rotation from the **initial side** along the positive x-axis to the **terminal side**. A counterclockwise rotation is associated with positive angle measure and a clockwise rotation is associated with negative angle measure. An angle can also be measured in radians.



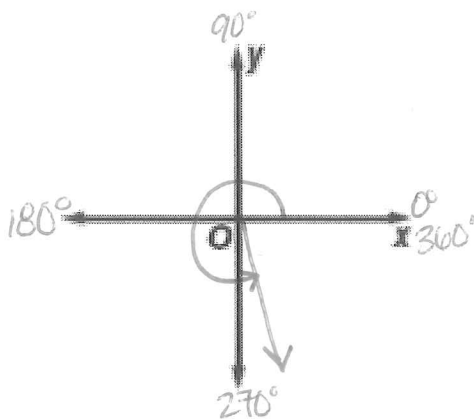
• rotates counter-clockwise (up)



• rotates clockwise (down)

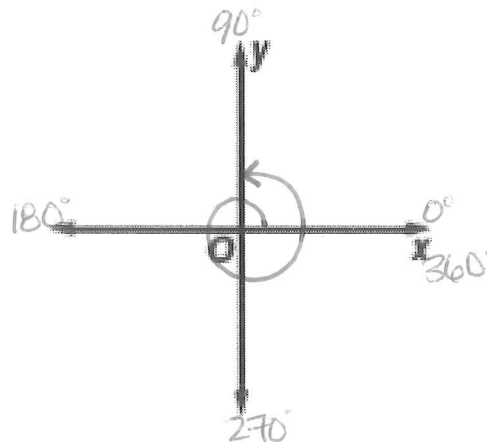
*standard position: An angle with its vertex at (0,0) AND starts on the positive x-axis.

Example 1 Draw an angle with measure 290° in standard notation.



Example 2: Draw 450°

$450 - 360 = 90$



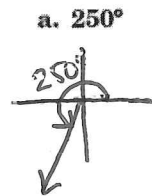
*an angle can make more than one revolutions

*one revolution is 360°

Coterminal Angles When two angles in standard position have the same terminal sides, they are called **coterminal angles**. You can find an angle that is coterminal to a given angle by adding or subtracting a multiple of 360° . In radian measure, a coterminal angle is found by adding or subtracting a multiple of 2π .



Example Find one angle with positive measure and one angle with negative measure coterminal with each angle.



a. 250°

$$250^\circ + 360^\circ = \boxed{610^\circ}$$

$$250^\circ - 360^\circ = \boxed{-110^\circ}$$

b. -120°

$$-120^\circ + 360^\circ = \boxed{240^\circ}$$

$$-120^\circ - 360^\circ = \boxed{-480^\circ}$$

c. $450^\circ = 450^\circ + 360^\circ = \boxed{810^\circ}$ positive

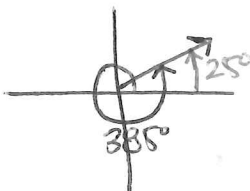
$$450^\circ - 360^\circ = \boxed{90^\circ}$$

$$90^\circ - 360^\circ = \boxed{-270^\circ}$$
 negative

EXAMPLE:

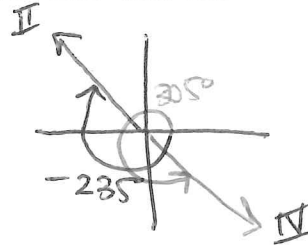
Prove whether or not the given angles are coterminal. (Show steps to justify answer)

A. 25° and 385°



$25^\circ + 360^\circ = 385^\circ \checkmark$
 Yes they are coterminal.

B. -235° and 305°



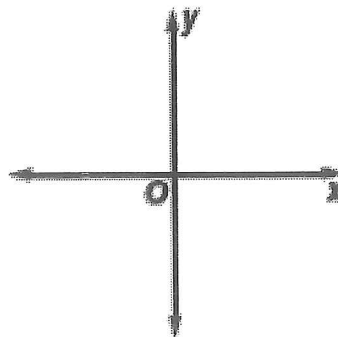
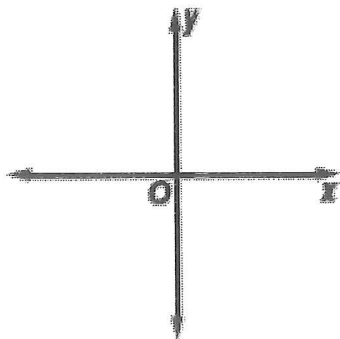
No, not coterminal b/c end in different quadrants

$$-235^\circ + 360^\circ = 125^\circ$$

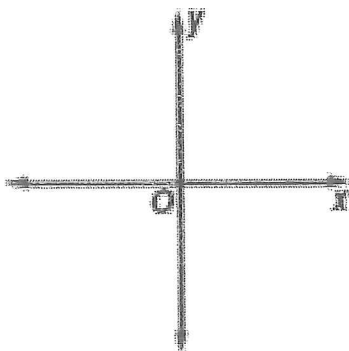
$$125^\circ + 360^\circ = 485^\circ$$

13-2 Notes, Angles and Angle Measurement

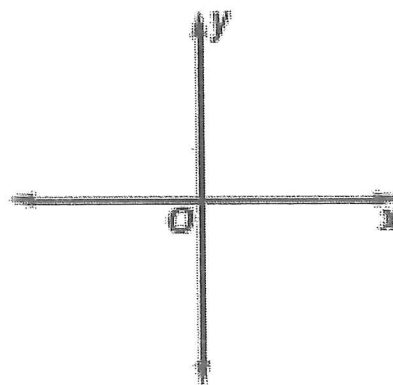
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Example Find one angle with positive measure and one angle with negative measure coterminal with each angle.

a. 250°

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c. 450°

EXAMPLE:

Prove whether or not the given angles are coterminal. (Show steps to justify answer)

A. 25° and 385°

B. -235° and 305°