

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## ROTATIONS AND ANGLE TERMINOLOGY COMMON CORE ALGEBRA II



In this unit we will be studying the three basic **trigonometric functions**. These functions are based on the geometry of a circle and rotations around its center. Sometimes the trigonometric functions are known as **circular functions**. In this introductory lesson we introduce some basic terminology and concepts concerning angles. Some of the terminology is specified below.

**Standard Position:** An angle is said to be drawn in standard position if its vertex is at the origin and its initial ray points along the positive  $x$ -axis.

**Positive and Negative Rotations:** A rotation is said to be positive if the initial ray is rotated counter-clockwise to the terminal ray and said to be negative if the initial ray is rotated clockwise to the terminal ray.

**Coterminal Angles:** Any two angles drawn in standard position that share a terminal ray.

**Reference Angles:** The positive acute angle formed by the terminal ray and the  $x$ -axis.

**Exercise #1:** For each of the following angles, given by the Greek letter **theta**, draw a rotation diagram and identify the quadrant that the terminal ray falls in.

(a)  $\theta = 145^\circ$

(b)  $\theta = 320^\circ$

(c)  $\theta = 72^\circ$

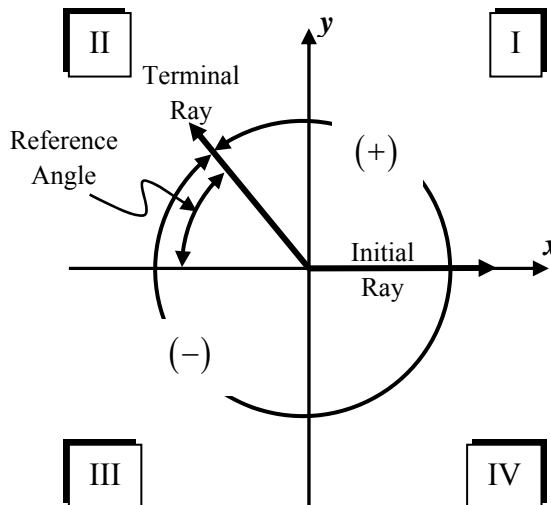
(d)  $\theta = -210^\circ$

(e)  $\theta = 250^\circ$

(f)  $\theta = -310^\circ$

(g)  $\theta = 460^\circ$

(h)  $\theta = -400^\circ$



**Exercise #2:** In which quadrant would the terminal ray of an angle drawn in standard position fall if the angle measures  $860^\circ$ ?

- (1) I                      (3) III  
(2) II                      (4) IV
- 

**Exercise #3:** Give a negative angle that is coterminal with each of the following positive angles, **alpha**.

- (a)  $\alpha = 90^\circ$                       (b)  $\alpha = 330^\circ$                       (c)  $\alpha = 120^\circ$                       (d)  $\alpha = 210^\circ$

**Exercise #4:** Coterminal angles drawn in standard position will always have measures that differ by an integer multiple of

- (1)  $90^\circ$                       (3)  $180^\circ$   
(2)  $360^\circ$                       (4)  $720^\circ$
- 

**Exercise #5:** For each of the following angles, **beta**, draw a rotation diagram and then state **beta's** reference angle,  $\beta_r$ .

- (a)  $\beta = 160^\circ$                       (b)  $\beta = 300^\circ$                       (c)  $\beta = 210^\circ$                       (d)  $\beta = 78^\circ$

- (e)  $\beta = -110^\circ$                       (f)  $\beta = -280^\circ$                       (g)  $\beta = 605^\circ$                       (h)  $\beta = -410^\circ$



Name: \_\_\_\_\_

Date: \_\_\_\_\_

**ROTATIONS AND ANGLE TERMINOLOGY  
COMMON CORE ALGEBRA II HOMEWORK**

**FLUENCY**

1. For each of the following angles, draw a rotation diagram and then state the quadrant the terminal ray of the angles falls within.

(a)  $\theta = 135^\circ$

(b)  $\theta = 300^\circ$

(c)  $\theta = -110^\circ$

(d)  $\theta = -310^\circ$

(e)  $\theta = 85^\circ$

(f)  $\theta = 560^\circ$

2. For each of the following angles, draw a rotation diagram and determine the reference angle.

(a)  $\alpha = 245^\circ$

(b)  $\alpha = 290^\circ$

(c)  $\alpha = 130^\circ$

(d)  $\alpha = -242^\circ$

(e)  $\alpha = 475^\circ$

(f)  $\alpha = -432^\circ$



3. Give two angles that are coterminal with each of the following angles. Make one of the coterminal angles positive and one negative.

(a)  $\theta = 105^\circ$

(b)  $\theta = 220^\circ$

(c)  $\theta = 80^\circ$

(d)  $\theta = -245^\circ$

4. When drawn in standard position, which of the following angles is coterminal to one that measures  $130^\circ$ ?

(1)  $430^\circ$

(3)  $850^\circ$

(2)  $-70^\circ$

(4)  $730^\circ$

\_\_\_\_\_

5. Which of the following angles, when drawn in standard position, would *not* be coterminal with an angle that measures  $270^\circ$ ?

(1)  $-90^\circ$

(3)  $630^\circ$

(2)  $990^\circ$

(4)  $720^\circ$

\_\_\_\_\_

6. Which of the following angles would *not* have a reference angle equal to  $30^\circ$ ?

(1)  $210^\circ$

(3)  $120^\circ$

(2)  $-330^\circ$

(4)  $-30^\circ$

\_\_\_\_\_

### REASONING

7. Angles are a measurement of rotation about a point. Are two coterminal angles the same rotation? Explain your answer. Diagrams are helpful.

