Integrated Math 3 Name: _____
Unit 4: Trig. Representations and Modeling
4.3 Date:_____ Period:_____

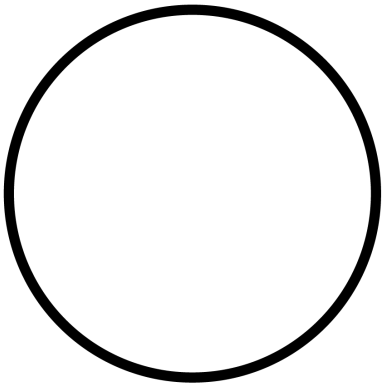
Part I Objective: To convert radian and degree measures.

Warm Up: If there are 5280 feet in a mile, how much of a mile is 218 feet?

What is a radian?

- A radian is another method of describing an angle measure (previously we only used degrees to measure angles).

- One radian = the measure of an angle whose intercepted arc is the length of the radius.



Having a conversion factor allows us to convert between two units

Background Knowledge:

1. How many degrees are in a circle? _____
2. How do you find circumference of a circle? _____
3. Using the circumference formula above, what is the EXACT circumference of a circle with radius of 1? _____
4. Therefore we can say _____ degrees = _____ radians

Rewrite a degree measure in radians by multiplying by $\frac{\pi \ radians}{180}$

Rewrite a radian measure in degrees by multiplying by $\frac{180}{\pi \ radians}$

Example 1: Convert the degree measure to radians.

A.) $110°$ B.) $45°$ C.) $320°$

D.) $225°$ E.) $330°$ F.) $-45°$

Example 2: Convert the radian measure to degrees.

A.) $-\frac{\pi}{9}$ B.) $-\frac{5\pi}{12}$ C.) $\frac{28\pi}{3}$

D.) $\frac{2\pi}{3}$ E.) $-\frac{3\pi}{2}$ F.) $\frac{5\pi}{6}$

Part II Objective: To analyze coterminal and reference angles.

Vocabulary:

Angle: A shape composed of two rays with a common endpoint, known as the vertex.

Standard Position: An angle whose vertex is at the origin and whose initial side is the positive x-axis.

Initial Side: The ray of the angle that is "fixed".

Terminal Side: The ray of the angles that gets rotated about the vertex.

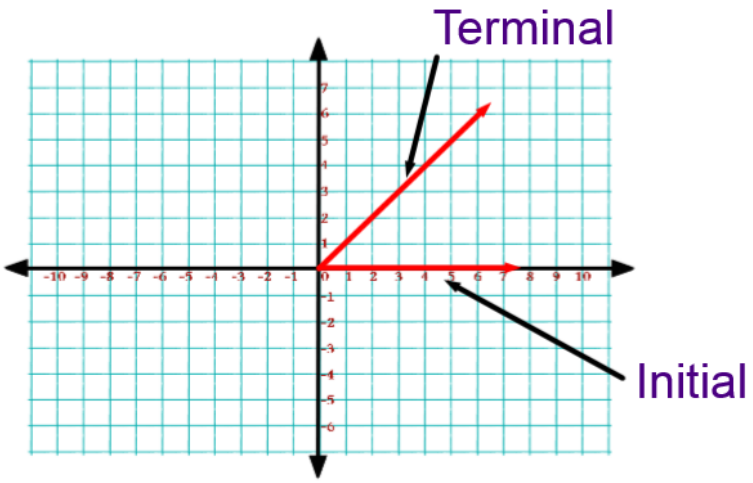
Coterminal: Two angles that are in standard position, whose terminal sides end at the same location.

Reference Angles: An angle (always acute in measure) formed by the terminal side and the x-axis.

Quadrantal Angle: An angle whose terminal side lies on an axis.

Fill in the blank:

Use the graph to complete each of the following



a. The initial side of an angle is always on the _____

b. When analyzing angles, positive angles are measured in a _____ direction and negative angles are measured in a _____ direction.

c. The angle above can be estimated to be __+_____ or __-_____

Angles in standard position

Example 1: Draw the following angles in standard position. Then tell which quadrant the terminal side lies in.

A.) $120°$ B.) $-45°$ C.) $510°$ D.) $-\frac{5\pi}{6}$

Coterminal Angles

Example 2: Determine the positive and negative coterminal angles of the given angle in degrees and radians.

A.) $120°$ B.) $45°$ C.) $210°$ D.) $\frac{\pi}{6}$

Reference Angles

Example 3: Determine the reference angles for the following:

A.) $120°$

B.) $-40°$

C.) $320°$

D.) $\frac{5\pi}{6}$

E.) $-\frac{3\pi}{4}$