Math 3 **7.2 Angles, Coterminal Angles, and Reference Angles** Unit 7

*EQ: How can you draw positive and negative angles on the coordinate plane and determine conterminal and reference angles?*

**Important Vocabulary**

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| **Angle:** Formed by two rays with the same endpoint **Vertex:** The endpoint of an angle | **Standard Position:** When the vertex of an angle is at the origin of the coordinate plane and one ray is on the positive x-axis |
| **Initial Side:** The ray of an angle found on the positive x-axis when the angle is in standard position | **Terminal Side:** The ray of an angle not found on the positive x-axis when the angle is in standard position (where the angle ends) |
| **Positive Angles:** Angles with degrees greater than 0 (counterclockwise) | **Negative Angles:** Angles with degrees less than o (clockwise) |

**Example 1:** Draw an angle with the given measure in standard position.



1. 70o
2. -135o

 

1. -31o
2. 117 o

**Coterminal Angles:** Two angles in standard position that share the same terminal side

* To find **positive** coterminalangles:
* To find **negative** coterminal angles:

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**Example 2:** Find the measure of a coterminal angle with the listed angle.

1. Find two positive coterminal angles with -410o
2. Find two negative coterminal angles 579o
3. Find one positive and one negative coterminal angles with 227o
4. Find the measure of an angle between 0 and 360o with -321o
5. Find the measure of an angle between 0 and 360o with 1054o

**Reference Angle:** The positive angle measure created with the terminal side of the angle and the x-axis.

**Example 3:** Sketch a graph each of the following in standard position. Be sure that your swoosh marks match the number of turns around the unit circle. Then, find the reference angle.



1. -460o
2. 553o



1. -1000o
2. 1000o