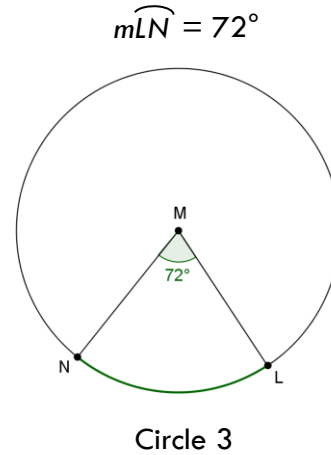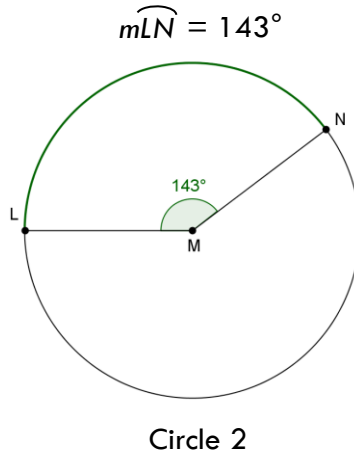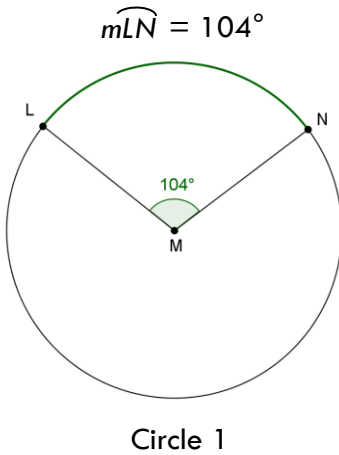Name_____Date_____

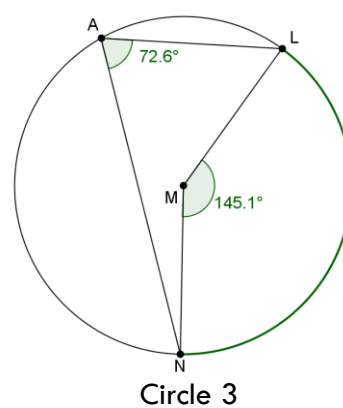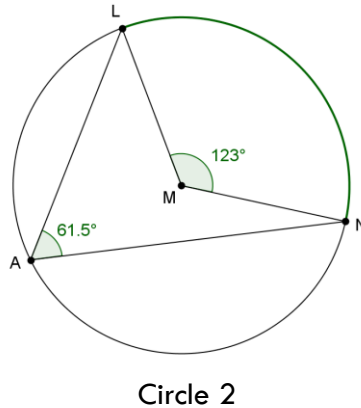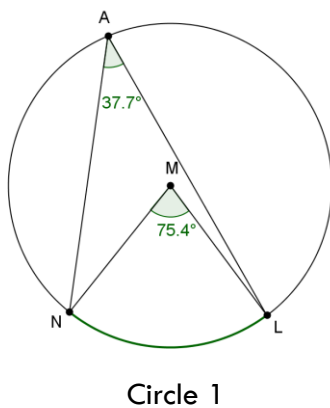## Angle Relationships in Circles
Explore — Answer Key

Directions: In each section below, compare the given information about arc measures or angle measures. Use your observations to answer the question that follows each set of circles, and then answer the debriefing questions.

Part 1: Central Angles

$$m\widehat{LN} = 104°$$

$$m\widehat{LN} = 143°$$

$$m\widehat{LN} = 72°$$

Circle 1

Circle 2

Circle 3

1. In the figures above, ∠LMN is a central angle with intercepted arc $\widehat{LN}$. What is the relationship between the measure of a central angle and its intercepted arc?
    The measure of a central angle is equal to the measure of its intercepted arc.

Part 2: Inscribed Angles

Circle 1

Circle 2

Circle 3

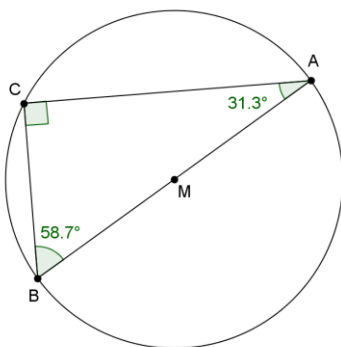| Circle Number	1	2	3
m∠LMN			
m∠LAN			

2. In the figures above, ∠LMN is a central angle of circle M and ∠LAN is an inscribed angle. What is the relationship between the measure of the inscribed angle and its intercepted arc, $\overset{\frown}{LN}$?
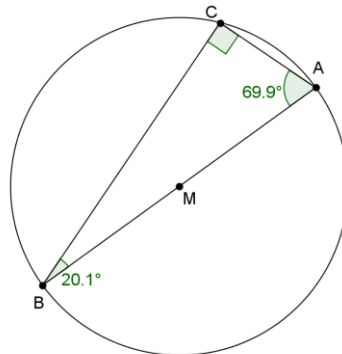
   The measure of the inscribed angle is one-half the measure of its intercepted arc.

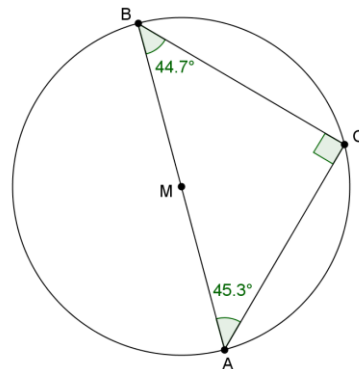 $$m\angle LAN = \frac{1}{2}m\overset{\frown}{LN}$$

Part 3: Inscribed Angles and Diameters

| Circle 1 | Circle 2 | Circle 3 |

3. In the circles above, $\overline{AB}$ is a diameter of circle M and ∠ACB is an inscribed angle. What can you conclude about the measure of an inscribed angle that intercepts a semicircle?

   If an inscribed angle intercepts a semicircle, then the measure of the inscribed angle will be 90°, and the inscribed angle will be a right angle.

Debriefing Questions

1. What is the relationship between the measure of a central angle and the measure of its intercepted arc?

   The measure of a central angle is equal to the measure of its intercepted arc.

2. What is the relationship between the measure of an inscribed angle and the measure of its intercepted arc?

   The measure of an inscribed angle is equal to one-half the measure of its intercepted arc.

3. If an inscribed angle intercepts a semicircle, what type of angle will the inscribed angle always be?

   If an inscribed angle intercepts a semicircle, it will be a right angle.