<name>
Class: Honors Geometry
Date: <date>
Topic: Lesson 7-7 (Areas of Circles and Sectors)
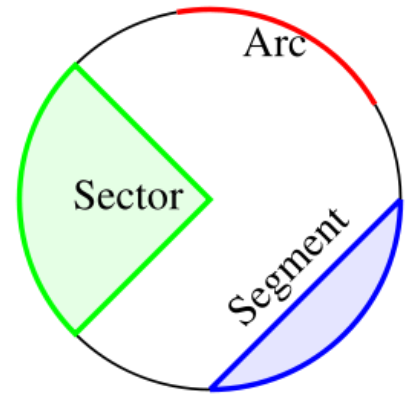
Theorem 7-15	**Area of a Circle**

$$A = \pi r^2$$

Definition	**Sector**

Region of circle btwn two radii & the included arc.

Theorem 7-16	**Area of a Sector of a Circle**

The area of sector $AOB = \dfrac{m\overset{\frown}{AB}}{360} \cdot \pi r^2$

Example

Find the area of sector ACB. Leave your answer in terms of π.

$$m\overset{\frown}{AB} = 100; \quad area \odot C = \pi(6)^2 = 36\pi$$

$$\text{Area of sector } AOB = \frac{m\overset{\frown}{AB}}{360} \cdot \pi r^2 = \frac{100}{360} \cdot 36\pi = \frac{100}{10} \cdot \pi = 10\pi \, m^2$$

Definition	**Segment of a Circle**

The part of a sector btwn the arc & a segment joining its endpts.
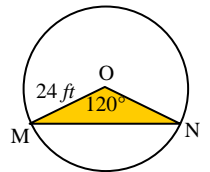
Formula	**Area of a segment**

Area of segment = area of sector − area of triangle.

Example

Find the area of the segment MON. Round your answer to the nearest tenth.

$$\text{Area of sector: } \frac{m\overset{\frown}{MN}}{360} \cdot \pi r^2 = \frac{120}{360} \cdot \pi 24^2 = \frac{1}{3} \cdot \pi \cdot 24 \cdot 24 = 8 \cdot 24 \cdot \pi = 192\pi$$

Area of triangle: 30-60-90 w/h = short leg & long leg ½ the base:

$$h = 24 \div 2 = 12; \quad b = 2 \cdot 12\sqrt{3} = 24\sqrt{3}; \quad A = \frac{1}{2}bh = \frac{1}{2} \cdot 12 \cdot 24\sqrt{3} = 144\sqrt{3}$$

Area of segment: $192\pi - 144\sqrt{3} \approx 353.77 \approx 353.8 \, ft^2$