

Warm-up 1/5/17

Convert from radians to degrees.

$$1. \frac{3\pi}{4} = 135^\circ$$

$$2. 2 \cdot \frac{180}{\pi} = 114.59^\circ$$

### Circular Arc Length

#### Arc Length Formula (Radian Measure)

If  $\theta$  is a central angle in a circle of radius  $r$ , and if  $\theta$  is measured in radians, then the length  $s$  of the intercepted arc is given by



$$s = r\theta$$

#### Arc Length Formula (Degree Measure)

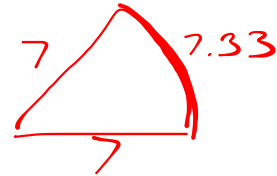
If  $\theta$  is a central angle in a circle of radius  $r$ , and if  $\theta$  is measured in degrees, then the length  $s$  of the intercepted arc is given by

$$s = \frac{\pi r \theta}{180}$$

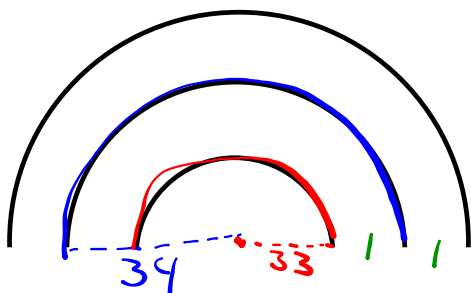
Find the perimeter of a  $60^\circ$  slice of a large (7-in. radius) pizza.

$$S = \frac{\pi (7)(60)}{180} \approx 7.33$$

$$P = 7 + 7 + 7.33 = 21.33$$



The running lanes at the Emery Sears track at Bluffton College are 1-meter wide. The inside radius of lane 1 is 33 meters and the inside radius of lane 2 is 34 meters. How much longer is lane 2 than lane 1 around the turn?



$$34\pi - 33\pi$$

$$\pi$$

Albert's truck has wheels 36 inches in diameter. If the wheels are rotating at 630 rpm (revolutions per minute), find the truck's speed in miles per hour.

$$\frac{630 \text{ rot.}}{1 \text{ min.}} \cdot \frac{60 \text{ min.}}{1 \text{ hr.}} \cdot \frac{36\pi \text{ in.}}{1 \text{ rot.}} \cdot \frac{1 \text{ ft}}{12 \text{ in.}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} =$$
$$\approx 67.47 \frac{\text{mi}}{\text{hr}}$$

Assignment: pp. 325 - 327

25 - 31, 35, 36, 45, 47, 61