SWBAT derive the conversion formulas of degrees to radians and vice versa.

SWBAT use the arc length formula to find specific measurements

Agenda:

- Warm-Up
- Create/derive formulas
- Use these formulas
- Understand arc length
- Exit Card

Warm - Up

How can we use last classes findings (2π rad in a circle) to create a conversion from radians to degrees?

Conversly to go from degrees to radians,

multiply by $\frac{\pi}{180 \text{ deg}}$

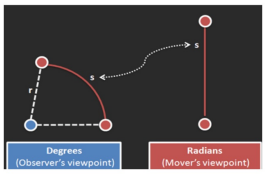
Examples

1) $\frac{2\pi}{5}$

2) 4π

3) 180 deg

4) 30 deg



Degrees measure a tilt of your head while radians measure distance traveled.

So we get radian = $\frac{\text{distance traveled}}{\text{radius}}$

In math form: $\theta = \frac{s}{r}$

Degrees to radians is harder to derive

Arc Length Formula (Degree Measure)

$$s = r\theta$$

where s is distance, r is radius, and θ is the central angle

Find the arc length given the following information.

1. r = 4in and $\theta = 65°$

2. r = 10cm and $\theta = 6$ rad

Given the following information find the missing radius.

3) s = 3.5 in and $\theta = \pi/3$

4) s = 40cm and $\theta = 75°$

Given the following information find the missing angles in radians

5) s = 18in and r = 9in

6) s = 35in and r = 10in

1) In a circle, a central angle of $\frac{1}{3}$ radians subtends an arc of 3 centimeters. Find the length, in centimeters, of the radius of the circle.

2) Find, in centimeters, the length of an arc intercepted by a central angle of 4 radians in a circle with a radius of 3.5 cm.

Exit Card:

A sector has a radius of 12 cm. and an angle of 65°. To the *nearest tenth of a cm.*, find its arc length.

Tonights HW

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#9 - 33 odd, 35, 36, 38

For 35 you might need:
P = r(θ + 2) where θ is in radians!