

Given two points on a circle:

a. An arc length is a portion of the Circumference of a circle.

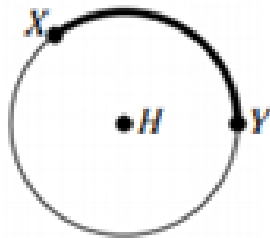
minor arc $< 180^\circ$

b. The minor arc is the shortest arc linking both points. The major arc is the longest and often defined using another point on the arc, and use all three points to define it.

Semicircle = 180

c. The ratio of the length of an arc to the Circumference is equal to the ratio of the measure of arc to 360° .

major arc > 180

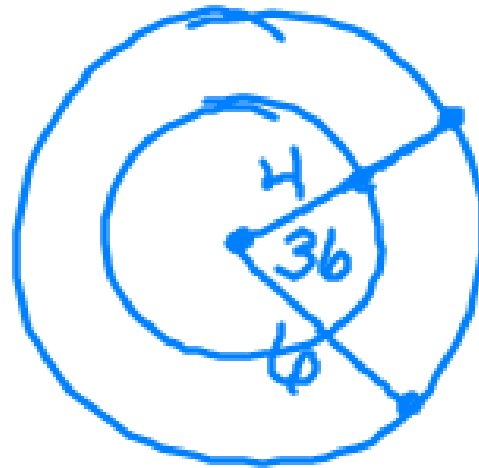


$$\frac{\widehat{XY}}{2\pi r} = \frac{m\widehat{XY}}{360^\circ}$$

Practice:

Suppose circles O and P have the same center with radii of 4 and 6 centimeters, respectively. \widehat{RE} is a minor arc in circle O and \widehat{MI} is a minor arc in circle P. Both arcs have an angle measure of 36° . Are their arc lengths the same? Justify your answer.

8π
 12π

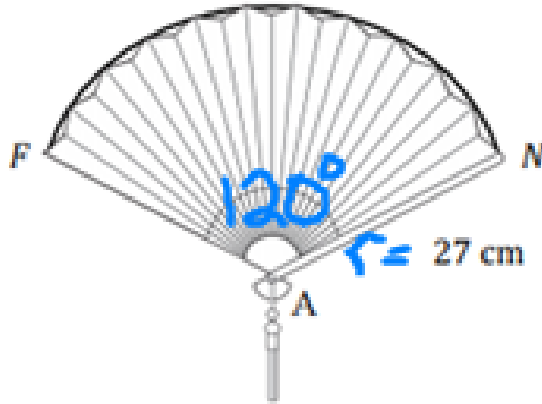


No, Circumference is different

Your turn:

Estimate the length of \widehat{FN} if $m\angle FAN = 120^\circ$. Use 3.14 for π .

$$C = d\pi$$
$$=$$



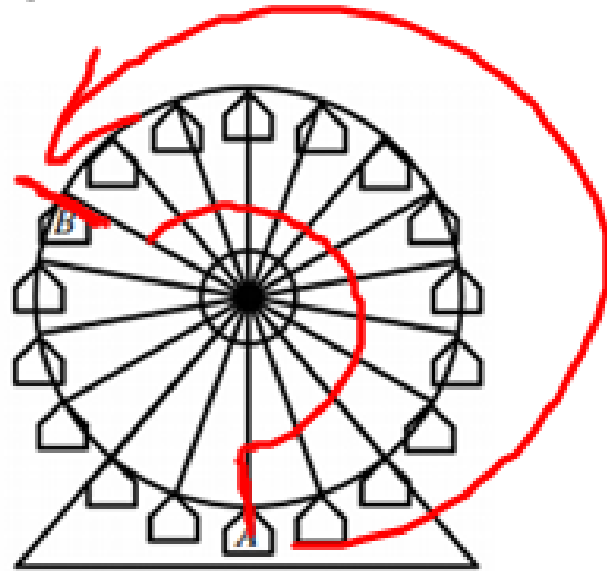
$$\frac{x}{54\pi} = \frac{120}{360}$$
$$\frac{x}{54\pi} = \frac{1}{3}$$
$$\frac{3x}{3} = \frac{54\pi}{3}$$
$$x = 18\pi$$
$$= 56.52 \text{ cm}$$

Informal Assessment:

Dominic is riding the Ferris Wheel at the county fair. The Ferris wheel has a radius of 60 ft and rotates counter clockwise. Seats are equidistant from each other.

$$C = 120\pi$$

$$\frac{\text{arclength}}{C} = \frac{\text{deg}}{360}$$



$$\frac{360}{18} = 20(12) = 240^\circ$$

- a. After the ride begins from point a, it pauses at point B.
How many feet has Dominic traveled when his seat pauses at point B?

$\pi = 3.14$ Round to nearest tenth.

$$\frac{x}{120\pi} = \frac{240}{360}$$
$$3x = 240\pi$$
$$x = 80\pi \approx 251.2$$

- b. About how many feet has Dominic traveled if the full ride is 4 revolutions?

$$120\pi(4) = 480\pi = 1507.2$$