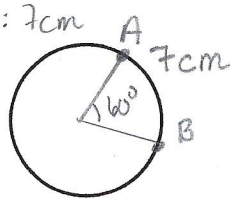
Name: Teacher Date: _____

Arcs

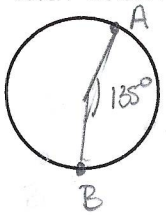
Arcs can be measured in ← symbol $\overset{\frown}{AB}$

- Degrees $\overset{\frown}{AB}$ 60°
- As a length $\overset{\frown}{AB}$: 7cm

Example:



In a circle, the measure of an arc in degrees is equal to the measure of the central angle that creates the arc.



$\overset{\frown}{AB}$ 135°

To find the length of the arc, we use a proportion using the relationship between the measure of the central angle and the circumference.

RULE: $\frac{\text{Central angle}}{360°} = \frac{\text{Arc Length}}{\text{Circumference}}$

$\frac{\angle}{360°} = \frac{\text{Arc}}{C}$

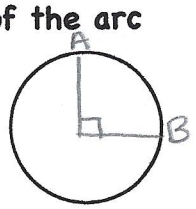
Fraction $\frac{\text{Part}}{\text{whole}}$

Angle fraction to Circle fraction

Example 1: Finding the length of the arc

Central angle = 90°

Radius= 5 cm



$\overset{\frown}{AB}$

1. $C = 2\pi r$
   $C = 2\pi 5$
   $C = 10\pi$
   $C = 31.4\text{cm}$

2. $\frac{\angle}{360°} = \frac{\text{Arc}}{C}$
   $\frac{90}{360°} = \frac{arc}{31.4}$

3. $\frac{90(31.4)}{360} = 7.85\text{cm}$

Steps:

1. Find the Circumference
2. Write your rule
3. Solve for the missing term

$\overset{\frown}{AB}$

Arc: 7.85 cm

Name: _____ Date: _____

Example 2 Finding the measure of the central angle

Arc Length = 7.85 cm
Radius = 10 cm

Steps:
1. Find the Circumference
2. Write your rule
3. Solve for the missing term

1. $C = 2\pi r$
$C = 2\pi(10)$
$C = 20\pi$
$C = 62.8$

2. $\frac{\angle}{360^\circ} = \frac{arc}{C}$
$\frac{\angle}{360^\circ} = \frac{7.85}{62.8}$

$\angle = 45^\circ$

Central Angle: 45° °

Example 3 Finding the radius

Central angle: 72°
Arc length of 6.28 cm

Steps:
1. Write your rule
2. Solve for the missing term
3. Use $d=\frac{c}{\pi}$ to find the diameter given the circumference. Then use $r=\frac{d}{2}$.

1. $\frac{\angle}{360^\circ} = \frac{Arc}{C}$
$\frac{72^\circ}{360^\circ} = \frac{6.28}{C}$

2. $C = 31.4$

3. $d = \frac{C}{\pi}$
$d = \frac{31.4}{\pi}$
$d = 10$

$r = \frac{d}{2}$
$r = \frac{10}{2}$
$r = 5cm$

Radius: 5 cm