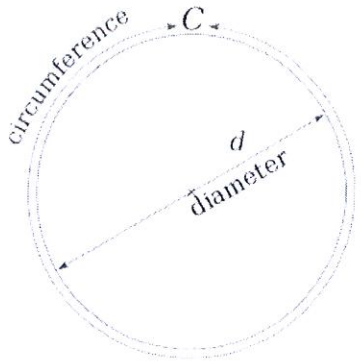
Geometry Name Key

Circumference and Arc Length Date _____

Quick Reminder!

The **circumference** of a circle is the distance around the circle.



- For all circles, the ratio of the circumference to the diameter is the same.
- The ratio is known as ***pi*** or **π**.
- π = **3.14**

Circumference = π • diameter = πd

Since the diameter is 2 times the radius . . . **Circumference = 2πr**

Practice Circumference Problems

1. Find the circumference of a pumpkin pie with a 24 cm diameter. Round to 2 decimal places.

$C = \pi d$

$= \pi (24) \approx$ 75.40 cm

2. A bicycle wheel has a radius of 45 cm. Find the circumference of the wheel. Leave your answer in terms of π.

$C = 2\pi r$

$= 2\pi (45)$

$=$ 90π cm

3. Find the radius of a discus with a circumference of 8.6π inches. Round to 2 decimal places.

$\frac{8.6\pi}{2\pi} = \frac{2\pi r}{2\pi}$

$r =$ 4.30 inches

4. Find the diameter of a frisbee with a circumference of 12π inches. Round to 2 decimal places.

$\frac{12\pi}{\pi} = \frac{\pi d}{\pi}$

diameter = 12 inches

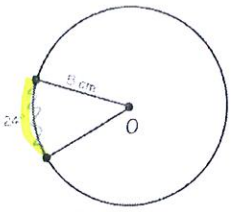
How do we find the length of an arc?

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

Arc Length = $\frac{\theta}{360} \cdot 2\pi r$

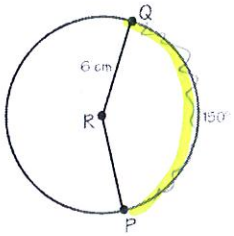
Practice Finding Arc Length!

1. Find the length of a 24° arc of a circle with a 5 cm radius. Leave your answer in terms of π.



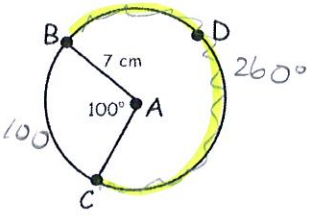
Arc length = $\frac{24}{360} \cdot 2\pi 5 = \frac{240\pi}{360} = \boxed{\frac{2\pi}{3}\text{ cm}}$

2. Find the length of $\overset{\frown}{QP}$. Leave your answer in terms of π.



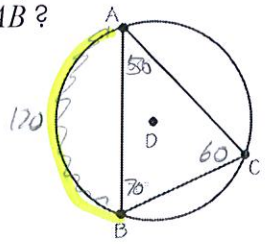
$AL = \frac{150}{360} \cdot 2\pi 6 = \boxed{5\pi\text{ cm}}$

3. Find the length of $\overset{\frown}{BDC}$. Leave your answer in terms of π.



$AL = \frac{260}{360} \cdot 2\pi 7 = \boxed{\frac{91\pi}{9}\text{ cm}}$

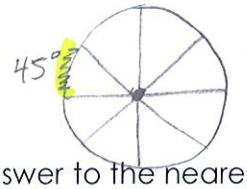
4. Circle D has radius 9 cm. What is the length of $\overset{\frown}{AB}$? Leave your answers in terms of π.



$AL = \frac{120}{360} \cdot 2\pi 9 = \boxed{6\pi\text{ cm}}$

5. A circular pizza with a diameter of 14 inches is cut into 8 equal slices. What is the arc length of one slice? Leave your answers in terms of π.

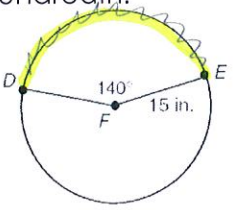
$r = 7$



$\frac{360}{8} = 45°$

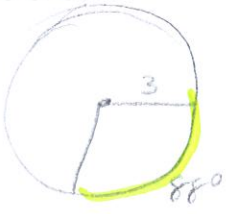
$AL = \frac{45}{360} \cdot 2\pi 7 = \boxed{\frac{7\pi}{4}\text{ in}}$

6. Find the arc length of the minor arc. Round your answer to the nearest hundredth.



$AL = \frac{140}{360} \cdot 2\pi 15 = \frac{35\pi}{3} \approx \boxed{36.65\text{ in}}$

7. The gear of a grandfather clock has a radius of 3 inches. To the nearest tenth of an inch, what distance does the gear cover when it rotates through an angle of 88°?



$AL = \frac{88}{360} \cdot 2\pi 3 = \frac{22\pi}{15} \approx \boxed{4.6\text{ in}}$