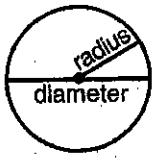
Name _____

# Circumference and Area of Circles

**Remember**

1. **Circumference** is the distance around a circle. Think of it as the circle's perimeter.

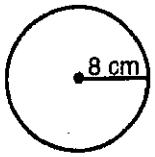



Circumference = π x diameter
$C = \pi d$ or
$C = 2\pi r$ (The diameter is twice the length of the radius: $d = 2r$.)

2. **Area** is the measure in square units of the interior of a circle.

Area = π x radius x radius $A = \pi r^2$

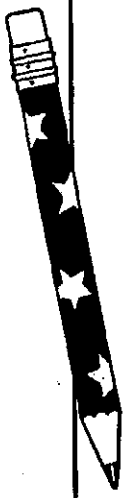
**Example:** Find the circumference and area of this circle. Use 3.14 as an approximation for π.




$C = 2\pi r$
$\approx 2 \cdot 3.14 \cdot 8$
$\approx 50.24$
$\approx 50$ cm

$A = \pi r^2$
$\approx 3.14 \cdot 8^2$
$\approx 200.96$
$\approx 201 \text{ cm}^2$

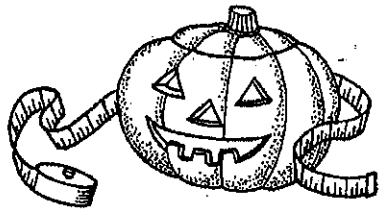
Draw straight lines to match each radius of a circle to its correct circumference and area. Use 3.14 for π. Write the uncrossed letters in the empty circles below to answer the riddle.



| Circumference | Radius | Area |
|---|---|---|
| 57 cm | 8 cm | 28 in.$^2$ |
| 113 m | 7 cm | 254 cm$^2$ |
| 50 cm | 18 m | 79 ft$^2$ |
| 38 in. | 3 in. | 1,017 m$^2$ |
| 31 ft | 10 ft | 314 ft$^2$ |
| 25 mm | 9 cm | 201 cm$^2$ |
| 44 cm | 14 m | 113 in.$^2$ |
| 88 m | 6 in. | 154 cm$^2$ |
| 19 in. | 5 ft | 50 mm$^2$ |
| 13 mm | 2 mm | 13 mm$^2$ |
| 63 ft | 4 mm | 615 m$^2$ |

P U T M A L M D P E K I A L N H C O P I T W

What do you get when you take the circumference of a jack-o'-lantern and divide it by its diameter?



Name _____

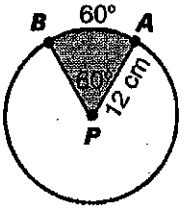
# Area of a Sector and Arc Length

**Remember**

1. A **sector** is a section of a circle that is bounded by two radii and their intercepted arc. The area of a sector is the area of a fraction of the entire circle.

   To find the fraction, divide the measure of the arc ($m$) by the measure of the entire circle (360°). Multiply that fraction by the area of a circle ($\pi r^2$) to find the area of the sector.

   **Area of a sector** $= \frac{m}{360°} \cdot \pi r^2$



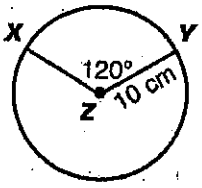

**Example:** Find the area of sector $BPA$.

$$A = \frac{60°}{360°} \cdot \pi \cdot (12 \text{ cm})^2$$
$$= \frac{1}{6} \cdot 144\pi \text{ cm}^2$$
$$= 24\pi \text{ cm}^2$$

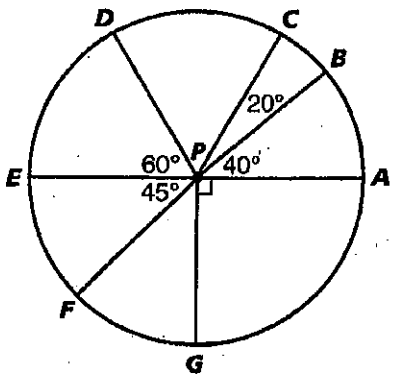
2. **Arc length** is a fraction of the circumference of a circle. Multiply the fraction of the circle by the circumference ($2\pi r$) to determine the arc length.

   **Arc length** $= \frac{m}{360°} \cdot 2\pi r$

**Example:** Find the length of $\overset{\frown}{XY}$.




$$\text{Arc length} = \frac{120°}{360°} \cdot 2\pi(10 \text{ cm})$$
$$= \frac{1}{3} \cdot 20\pi \text{ cm}$$
$$= \frac{20}{3}\pi \text{ cm}$$




**$P$ is the center point.**
**$\overline{EA}$ is a diameter.**

Use the diagram and each given radius or diameter to find the area of the sector (in square meters) or the length of the arc named (in meters). Then shade in your answers.

1. $EP = 6$ m; Area of sector $EPD$ = _____
2. $DP = 9$ m; Area of sector $EPC$ = _____
3. $EA = 12$ m; Area of sector $BPA$ = _____
4. $PG = 10$ m; Area of sector $GPA$ = _____
5. $FP = 16$ m; Area of sector $GPF$ = _____
6. $EA = 36$ m; Area of sector $CPB$ = _____
7. $DP = 18$ m; Length of $\overset{\frown}{DC}$ = _____
8. $PB = 10$ m; Length of $\overset{\frown}{CB}$ = _____
9. $EA = 24$ m; Length of $\overset{\frown}{FA}$ = _____
10. $GP = 15$ m; Length of $\overset{\frown}{FG}$ = _____
11. $EA = 16$ m; Length of $\overset{\frown}{EG}$ = _____
12. $PD = 30$ m; Length of $\overset{\frown}{DA}$ = _____