10.4 Circumference and Area of a Circle

Goal: Find the circumferences and areas of circles.

Vocabulary

Circle:

Center:

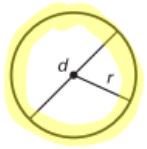
Radius:

Diameter:

Circumference:

Circumference of a Circle

Words The circumference C of a circle is the product of π and the diameter d, or twice the product of π and the radius r.



Algebra $C = \pi d$ or $C = 2\pi r$

Example 1 *Finding the Circumference of a Circle*

Labels A circular label has a diameter of 3.33 inches. Approximate the distance around the label to the nearest inch.

$C = \pi d$

$C = 2\pi r$

Solution

When the radius or diameter of a circle is divisible by 7, use $\frac{22}{7}$ to approximate π. Otherwise, use 3.14 to approximate π.

$C = \pi d$ Write formula for circumference of a circle.

$\approx \pi\,(3.33)$ Substitute for π and for d.

$= 10.46$ Multiply.

Answer: The distance around the label is about 10 inches

Example 2 *Finding the Radius of a Circle*

The circumference of a circle is 56 feet. Find the radius of the circle to the nearest foot.

$C = 56$ ft.

$\pi \to 3.14$

$C = 2\pi r$ Write formula for circumference of a circle.

$56 \approx 2\,(3.14)\,r$ Substitute for C and for π.

$56 \approx 6.28\,r$ Multiply.

$9 \approx r$ Divide each side by 6.28. Use a calculator.

$C = \pi d$

$C = 2\pi r$

Answer: The radius of the circle is about 9 ft.

Area of a Circle

Words The area A of a circle is the product of π and the ~~square~~ diameter of the radius r.

Algebra $A = \pi r^2$

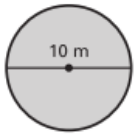
Example 3 *Finding the Area of a Circle*

Find the area of the circle to the nearest square meter.

$A = \pi \cdot r^2$

1. Find the radius.

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



2. Find the area.

$A = \pi r^2$ Write formula for area of a circle.

$\approx 3.14(5)^2$ Substitute for π and for r.

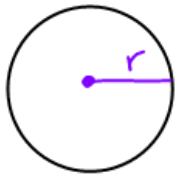
$= 78.5$ Simplify.

Answer: The area of the circle is about 79 square meters

Example 4 *Finding the Radius of a Circle*

$A = 39.25\ yd^2$

The area of a circle is 39.25 square yards. Find the radius of the circle to the nearest tenth of a yard.



$A = \pi r^2$ Write formula for area of a circle.

$39.25 \approx 3.14 r^2$ Substitute for A and for π.

$\frac{39.25}{3.14} \approx \frac{3.14 r^2}{3.14}$ Divide each side by 3.14.

$12.5 \approx r^2$

$3.5 \approx r$ Take positive square root of each side.

$3.5 \approx r$ Use a calculator to approximate square root.

Answer: To the nearest tenth of a yard, the radius of the circle is about 3.5 yds

Checkpoint **Find the circumference and the area of the circle. Round to the nearest whole number.**

1.

2.