8.7 Area and Circumference of Circles

Goal: To be able to find the circumference and area of circles

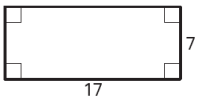
Warm up

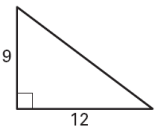
Solve the proportion.

1. $\frac{a}{21} = \frac{1}{3}$

2. $\frac{2}{x} = \frac{45}{360}$

Find the perimeter and area of the figure.

3. 

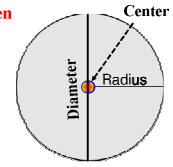
4. 

Jan 24-5:47 PM

A circle is the set of all points in a plane that are the same distance from a given point called the center.

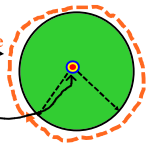
Radius: the distance from the center to a point on the circle

Diameter: The distance across the circle, through the center.

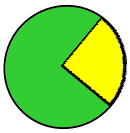


Circumference: The distance around a circle

Central angle: an angle whose vertex is the center of the circle and whose rays are radii of the circle



Sector: A region of the circle determined by two radii and a part of the circle



Jan 24-5:51 PM

π Pi is a Greek letter which stands for the ratio of a circle's circumference to its radius.
****It is an irrational number(never ending, nonrepeating decimal).**
The first 5 decimal places are: 3.14159....

Circumference of a Circle:

Circumference $= \pi$(diameter)

$C = \pi d$

Circumference $= 2\pi$(radius)

$C = 2\pi r$

Area of a Circle:

Area $= \pi$(radius)^2

$A = \pi r^2$

Jan 24-6:17 PM

Find the Circumference of a Circle

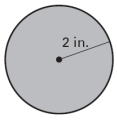
Find the circumference of the circle.

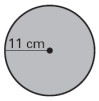
Solution

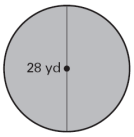
$C = 2\pi r$	Formula for the circumference
$= 2\pi(4)$	Substitute 4 for r.
$= 8\pi$	Simplify.
$\approx 8(3.14)$	Use 3.14 as an approximation for π.
$= 25.12$	Multiply.

ANSWER ▶ The circumference is about 25 inches.

Find the circumference of the circle. Round your answer to the nearest whole number.

1. 

2. 

3. 

Jan 24-6:26 PM

Find the Area of a Circle

Find the area of the circle.

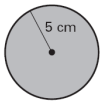
Solution

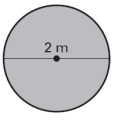
$A = \pi r^2$	Formula for the area of a circle
$= \pi(7)^2$	Substitute 7 for r.
$= 49\pi$	Simplify.
≈ 153.94	Use a calculator.

ANSWER ▶ The area is about 154 square centimeters.

Find the area of the circle. Round your answer to the nearest whole number.

4. 

5. 

6. 

Jan 24-6:32 PM

Use the Area of a Circle

Find the radius of a circle with an area of 380 square feet.

$A = 380$ ft^2

Solution

$A = \pi r^2$	Formula for the area of a circle
$380 = \pi r^2$	Substitute 380 for A.
$120.96 \approx r^2$	Divide each side by π. Use a calculator.
$11 \approx r$	Take the positive square root.

ANSWER ▶ The radius is about 11 feet.

Find the radius of a circle with an area of 255 square centimeters.

Jan 24-7:06 PM

Find the Area of a Sector

Solution

- First find the area of the circle.

  $A = \pi r^2 = \pi(9)^2 \approx 254.47$

  The area of the circle is about 254 square meters.

- Then find the area of the sector. Let x equal the area of the sector.

$$\frac{\text{Area of sector}}{\text{Area of entire circle}} = \frac{\text{Measure of central angle}}{\text{Measure of entire circle}}$$

$\frac{x}{254} = \frac{120°}{360°}$	Substitute.
$360x = 254 \cdot 120$	Cross product property
$360x = 30{,}480$	Simplify.
$\frac{360x}{360} = \frac{30{,}480}{360}$	Divide each side by 360.
$x \approx 84.67$	Simplify.

ANSWER The area of the sector is about 85 square meters.

Find the area of the shaded sector. Round your answer to the nearest whole number.

7.

8.

9.

Jan 24-6:37 PM