Geometry Unit 10

11-1: Circumferences and Areas of Circles

Warm-Up

On the whiteboards:

Give the Equations for the area of the following figures:

1.) Square: $A = s^2$

2.) Parallelogram: $A = b \times h$

3.) Triangle: $A = \frac{1}{2}(b \times h)$

4.) Rhombus: $A = \frac{1}{2} d_1 d_2$

5.) Trapezoid: $A = \frac{1}{2} \times h(b_1 + b_2)$

6.) Any Regular Polygon: $A = \frac{1}{2} \times a \times p$

Circumferences and Areas of Circles

- **Content Objective**: Students will be able to use equations to solve for the circumference and area of circles.

- **Language Objective**: Students will be able to identify the parts of a circle that are required to solve for its circumference and area.

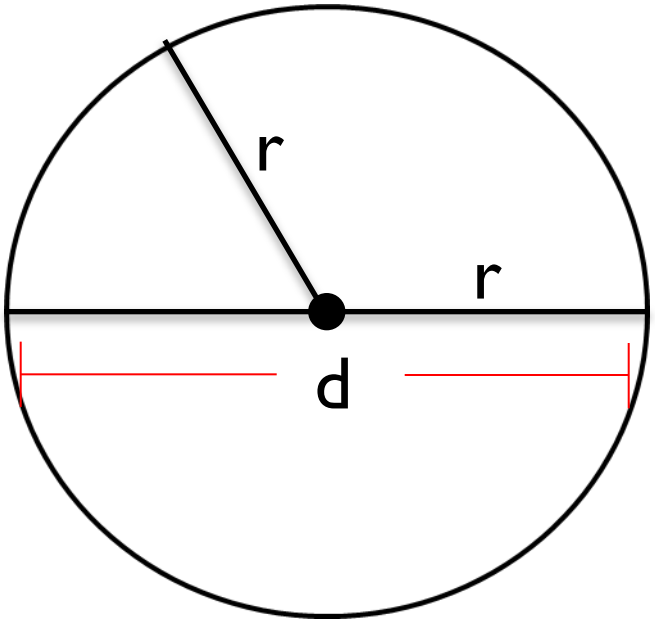
Circles - Equations

Circumference:

With radius r : $C = 2\pi r$

With diameter d : $C = d\pi$

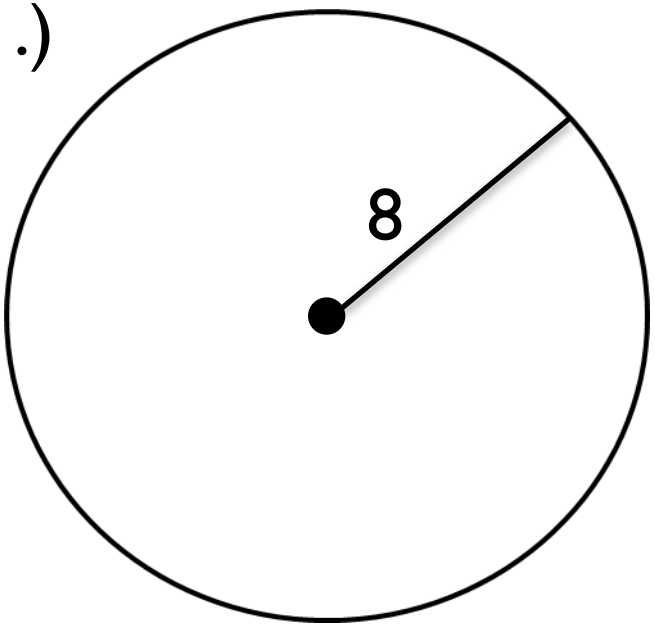
Area with radius r : $C = \pi r^2$



Practice:

Find the area and circumference of a circle with the given radius or diameter.

1.)



$$C = 2\pi r$$

$$\boldsymbol{C = 2\pi \times 8 = 16\pi}$$

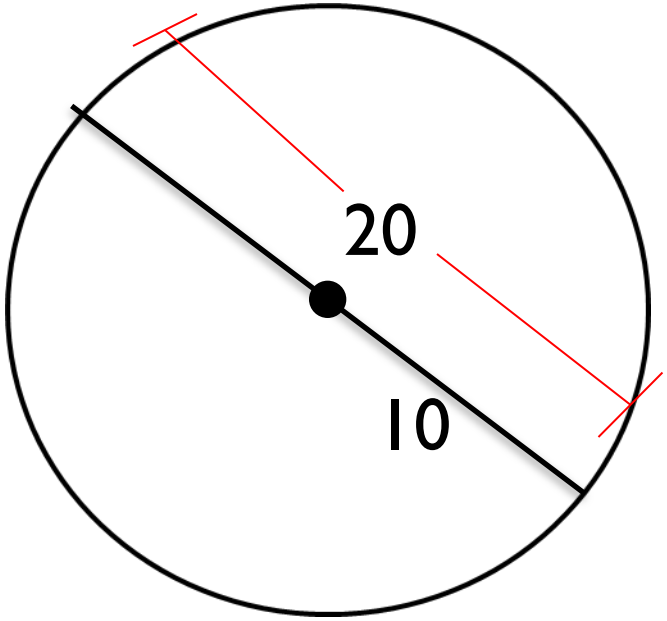
$$A = \pi r^2$$

$$\boldsymbol{A = \pi \times 8^2 = 64\pi}$$

Practice:

Find the area and circumference of a circle with the given radius or diameter.

2.)



$$C = 2\pi r$$

$$\boldsymbol{C = 2\pi \times 10 = 20\pi}$$

$$A = \pi r^2$$

$$\boldsymbol{A = \pi \times 10^2 = 100\pi}$$

Practice:

3.) Given a circle with area of 75π, find the

Radius: $75\pi = \pi r^2$

$75 = r^2$

$r = 5\sqrt{3}$

Diameter: $d = 2 \times r$

$d = 2 \times 5\sqrt{3} = 10\sqrt{3}$

Circumference: $C = d\pi$

$C = 10\pi\sqrt{3}$

Practice:

Given a circle with a circumference of 30π, find the

Radius: $30\pi = 2\pi r$

$r = 15$

Diameter: $d = 2 \times r$

$d = 30$

Area: $A = \pi r^2$

$A = \pi \times 15^2$

$A = 225\pi$

Practice:

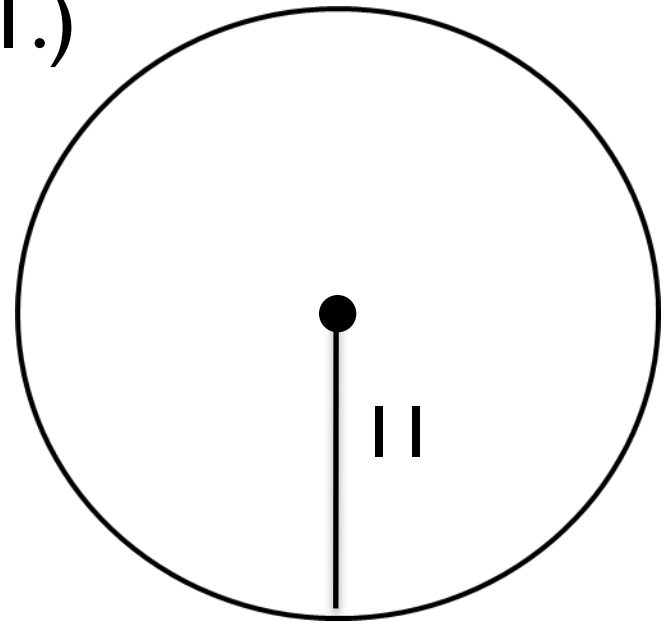
Complete the table.

Radius	3	4	0.8	5	9	6	7	12
Circumference	6π	8π	1.6π	10π	18π	12π	14π	24π
Area	9π	16π	6.4π	25π	81π	36π	49π	144π

Group Practice:

Find the area and circumference of a circle with the given radius or diameter.

1.)



$$C = 2\pi r$$

$$\boldsymbol{C = 2\pi \times 11 = 22\pi}$$

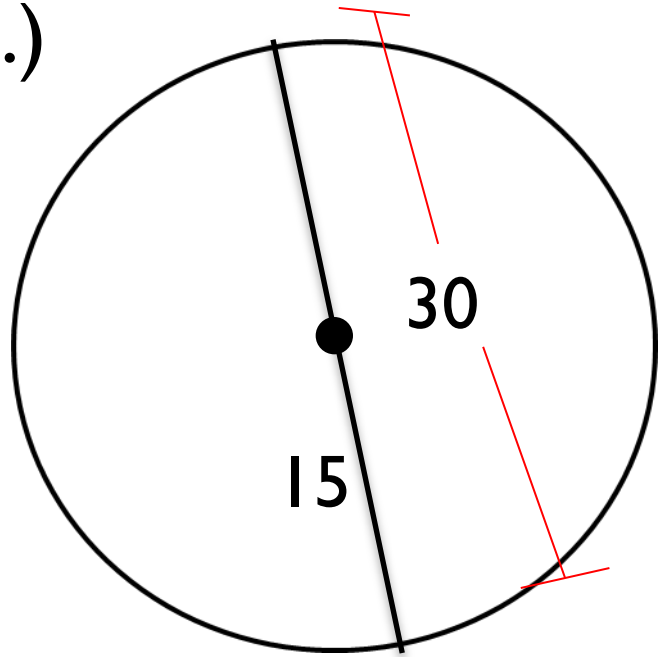
$$A = \pi r^2$$

$$\boldsymbol{A = \pi \times 11^2 = 121\pi}$$

Group Practice:

Find the area and circumference of a circle with the given radius or diameter.

2.)



$$C = 2\pi r$$

$$\boldsymbol{C = 2\pi \times 15 = 30\pi}$$

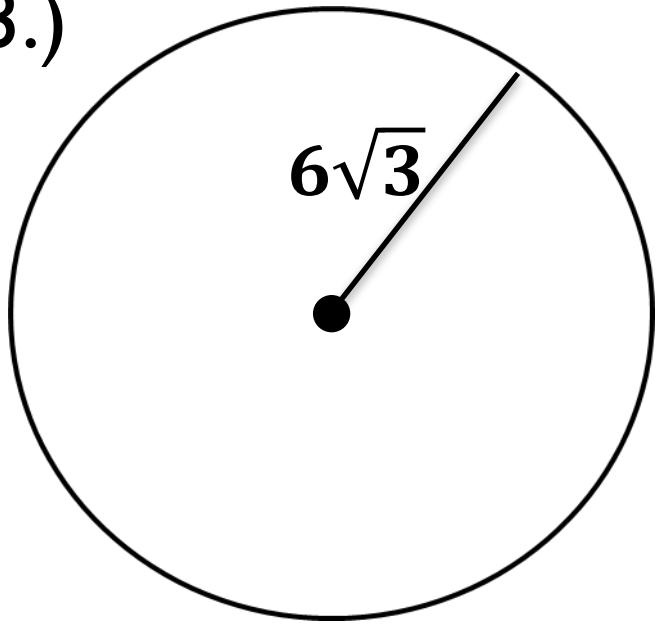
$$A = \pi r^2$$

$$\boldsymbol{A = \pi \times 15^2 = 225\pi}$$

Group Practice:

Find the area and circumference of a circle with the given radius or diameter.

3.)



$$C = 2\pi r$$

$$\boldsymbol{C = 2\pi \times 6\sqrt{3} = 12\sqrt{3}\pi}$$

$$A = \pi r^2$$

$$A = \pi \times (6\sqrt{3})^2$$

$$\boldsymbol{A = (36 \times 3)\pi = 108\pi}$$

Group Practice:

4.) Given a circle with area of 36π, find the

Radius: $36\pi = \pi r^2$

$36 = r^2$

$r = 6$

Diameter: $d = 2 \times r$

$d = 2 \times 6 = 12$

Circumference: $C = d\pi$

$C = 12\pi$

Practice:

5.) Given a circle with a circumference of 25π, find the

Radius: $25\pi = 2\pi r$

$r = 12.5$

Diameter: $d = 2 \times r$

$d = 25$

Area: $A = \pi r^2$

$A = \pi \times 12.5^2$

$A = 156.25\pi$

Group Practice:

6.) Given a circle with area of 80π, find the

Radius: $80\pi = \pi r^2$

$80 = r^2$

$r = 4\sqrt{5}$

Diameter: $d = 2 \times r$

$d = 2 \times 4\sqrt{5} = 8\sqrt{5}$

Circumference: $C = d\pi$

$C = 8\pi\sqrt{5}$

Practice:

7.) Given a circle with a circumference of 40π, find the

Radius: $40\pi = 2\pi r$

$r = 20$

Diameter: $d = 2 \times r$

$d = 40$

Area: $A = \pi r^2$

$A = \pi \times 20^2$

$A = 400\pi$

Group Practice:

Complete the table.

Radius	7	120	$\frac{5}{2}$	$6\sqrt{2}$	10	6	5	$5\sqrt{2}$
Circumference	14π	240π	5π	$12\sqrt{2}\pi$	20π	12π	10π	$10\sqrt{2}\pi$
Area	49π		$\frac{25}{4}\pi$	72π	100π	36π	25π	50π

14400π