

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

CIRCLES & AREA

PERIOD: \_\_\_\_\_

## How Do You Find the Area of a Circle?

(Topic #4)

**ACTIVITY:** Work with a partner. Read and discuss each question below. Write your response in the space. Justify your reasoning.

**Adrienne bought an 8-foot leash for her dog.**

1. Adrienne wants to find the distance the dog runs when it runs one circle with the leash fully extended. Should she calculate the circumference or area? Explain.
2. Suppose she wants to find the amount of running room the dog has with the leash fully extended. Should she calculate the circumference or area? Explain.
3. Describe a real-world situation that would involve finding the area of a circle.
4. Describe a real-world situation that would involve finding the circumference of a circle.

### Area of a Circle

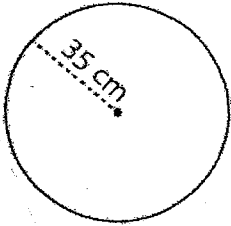
The area,  $A$ , of a circle equals the product of  $\pi$  and the square of its radius,  $r$ .

$$A = \pi r^2$$

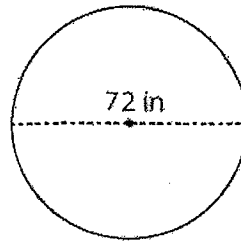
NOTE: Area is measured in squared units.

**EXAMPLE 1: Finding Areas of Circles**

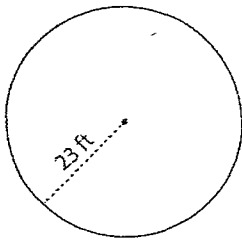
- a) Find the area of the circle. Round to the nearest hundredth.



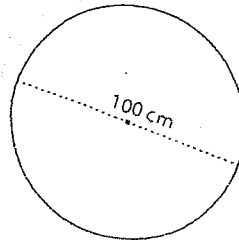
- b) Find the area of the circle. Round to the nearest tenth.



- c) Find the area of the circle. Leave your answer in terms of  $\pi$ .



- d) Find the area of the circle. Leave your answer in terms of  $\pi$ .



**PRACTICE: Read and answer each question below. Show all work.**

1. Find the area of the circle with a radius of 3.2 centimeters. Round to the nearest hundredth.

2. Find the area of the face of the Virginia quarter with a diameter of 24 millimeters. Round to the nearest tenth.

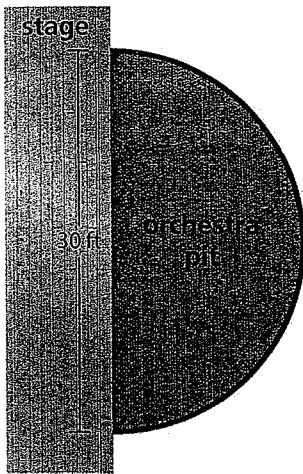
3. The bottom of a circular swimming pool with a diameter of 30 feet is painted blue. How many square feet are blue? Leave your answer in terms of  $\pi$ .

4. Find the area of a circle with a radius of 21 feet. Leave your answer in terms of  $\pi$ .

The semicircle is half of a circle. The formula for the area of a semicircle is  $A = \frac{1}{2} \pi r^2$ .

**EXAMPLE 2: Finding the Area of a Semicircle**

a) Find the area of the semicircular orchestra pit. Round to the nearest hundredth.



**PRACTICE:** Read and answer each question below. *Show all work.*

5. On a basketball court, there is a semicircle above the free-throw line that has a diameter of 12 feet. Find the area of the semicircle. Round to the *nearest tenth*.

6. Find the approximate area of a semicircle with a radius of 6 centimeters. Round to the *nearest tenth*.

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

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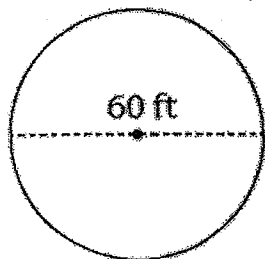
### **HOMEWORK - (Topic #4)**

#### **Finding the Area of a Circle**

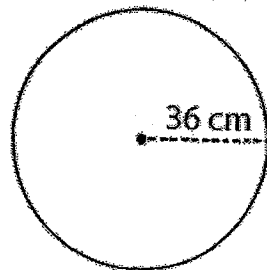
1. Find the area of a circle with a radius of 6 feet. Round to the *nearest tenth*.

2. Find the area of a circle with a diameter of 28 meters. Round to the *nearest meter*.

3. Find the area of the circle. Leave your answer in terms of  $\pi$ .

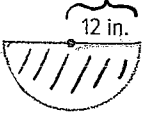
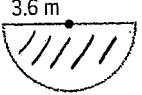
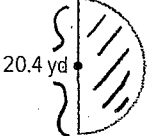


4. Find the area of the circle. Leave your answer in terms of  $\pi$ .



5. A rotating sprinkler that sprays water at a radius of 11 feet is used to water the lawn. Find the area of the lawn that is watered. Round to the *nearest tenth*.

Find the area of each semicircle. *Show all work.*

	Leave in terms of $\pi$ .	Round to the <i>nearest tenth</i> .
6. 		
7. 		
8. 		

9. The tunnel opening is a semicircle and has a diameter of 23 feet. Find the area, to the *nearest tenth*, of the opening of the tunnel enclosed by the semicircle.

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## How Do You Find the Area of a Circle?

(Topic #4)

**ACTIVITY:** Work with a partner. Read and discuss each question below. Write your response in the space. Justify your reasoning.

Adrienne bought an 8-foot leash for her dog.

1. Adrienne wants to find the distance the dog runs when it runs one circle with the leash fully extended. Should she calculate the circumference or area? Explain.

*circumference b/c she is looking for the distance around a circle.*

2. Suppose she wants to find the amount of running room the dog has with the leash fully extended. Should she calculate the circumference or area? Explain.

*Area*

3. Describe a real-world situation that would involve finding the area of a circle.

*Answers will vary*

4. Describe a real-world situation that would involve finding the circumference of a circle.

*Answers will vary*

### Area of a Circle

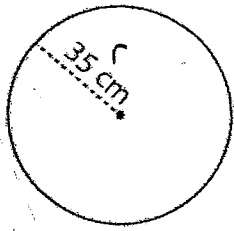
The area,  $A$ , of a circle equals the product of  $\pi$  and the square of its radius,  $r$ .

$$A = \pi r^2$$

NOTE: Area is measured in squared units.

**EXAMPLE 1: Finding Areas of Circles**

a) Find the area of the circle. Round to the nearest hundredth.



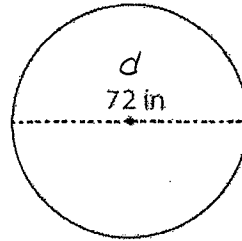
$$A = \pi r^2$$

$$A = \pi (35)^2$$

$$A = 3848.45/1001$$

$$A \approx 3848.45 \text{ cm}^2$$

b) Find the area of the circle. Round to the nearest tenth.



$$A = \pi r^2$$

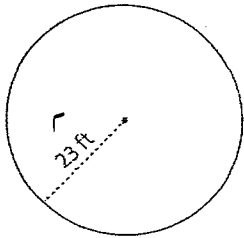
$$A = \pi (36)^2$$

$$A = 4071.50/4079$$

$$A \approx 4071.50 \text{ in}^2$$

$$r = \frac{72}{2} = 36$$

c) Find the area of the circle. Leave your answer in terms of  $\pi$ .

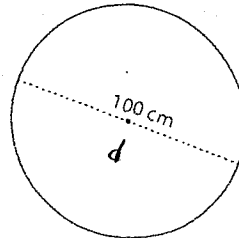


$$A = \pi r^2$$

$$A = \pi (23)^2$$

$$A = 529 \pi \text{ ft}^2$$

d) Find the area of the circle. Leave your answer in terms of  $\pi$ .



$$A = \pi r^2$$

$$A = \pi (50)^2$$

$$A = 2500 \pi \text{ cm}^2$$

$$r = \frac{100}{2} = 50$$

**PRACTICE: Read and answer each question below. Show all work.**

1. Find the area of the circle with a radius of 3.2 centimeters. Round to the nearest hundredth.

$$A = \underline{\hspace{2cm}}$$

$$r = 3.2 \text{ cm}$$

$$A = \pi r^2$$

$$A = \pi (3.2)^2$$

$$A = 32.16 \overline{)990877}$$

$$A \approx 32.17 \text{ cm}^2$$

2. Find the area of the face of the Virginia quarter with a diameter of 24 millimeters. Round to the nearest tenth.

$$A = \underline{\hspace{2cm}}$$

$$d = 24 \text{ mm}$$

$$r = 12 \text{ mm}$$

$$A = \pi r^2$$

$$A = \pi (12)^2$$

$$A = 452.3 \overline{)93421}$$

$$A \approx 452.4 \text{ mm}^2$$



3. The bottom of a circular swimming pool with a diameter of 30 feet is painted blue. How many square feet are blue? Leave your answer in terms of  $\pi$ .

$$A = \underline{\hspace{2cm}}$$

$$d = 30 \text{ ft}$$

$$r = 15 \text{ ft}$$

$$A = \pi r^2$$

$$A = \pi (15)^2$$

$$A = 225\pi \text{ ft}^2$$

4. Find the area of a circle with a radius of 21 feet. Leave your answer in terms of  $\pi$ .

$$A = \underline{\hspace{2cm}}$$

$$r = 21 \text{ ft}$$

$$A = \pi r^2$$

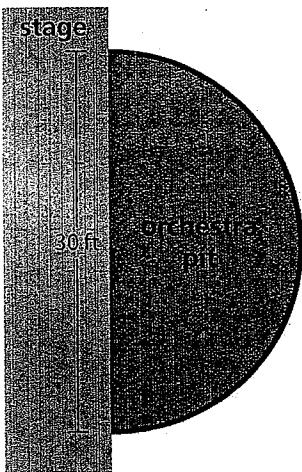
$$A = \pi (21)^2$$

$$A = 441\pi \text{ ft}^2$$

The semicircle is half of a circle. The formula for the area of a semicircle is  $A = \frac{1}{2} \pi r^2$ .

**EXAMPLE 2: Finding the Area of a Semicircle**

- a) Find the area of the semicircular orchestra pit. Round to the nearest hundredth.



$$d = 30$$

$$r = 15 \text{ ft}$$

$$A = \frac{1}{2} \pi r^2$$

$$A = \frac{1}{2} \pi (15)^2$$

$$A = 353.4291735$$

$$A \approx 353.43 \text{ ft}^2$$

**PRACTICE:** Read and answer each question below. *Show all work.*

5. On a basketball court, there is a semicircle above the free-throw line that has a diameter of 12 feet. Find the area of the semicircle. Round to the *nearest tenth*.

$$A = \underline{\hspace{2cm}}$$

$$d = 12 \text{ ft}$$

$$r = 6 \text{ ft}$$

$$A = \frac{1}{2} \pi r^2$$

$$A = \frac{1}{2} \pi (6)^2$$

$$A = 56.51866776$$

$$A = 56.5 \text{ ft}^2$$

6. Find the approximate area of a semicircle with a radius of 6 centimeters. Round to the *nearest tenth*.

$$A = \underline{\hspace{2cm}}$$

$$r = 6 \text{ cm}$$

$$A = \frac{1}{2} \pi r^2$$

$$A = \frac{1}{2} \pi (6)^2$$

$$A = 56.5 \text{ cm}^2$$

**HOMEWORK - (Topic #4)**  
**Finding the Area of a Circle**

1. Find the area of a circle with a radius of 6 feet. Round to the *nearest tenth*.

$$A = \pi r^2$$

$$A = \pi (6)^2$$

$$A = 113.0973355$$

$$A = 113.1 \text{ ft}^2$$

2. Find the area of a circle with a diameter of 28 meters. Round to the *nearest meter*.

$$d = 28 \text{ m}$$

$$r = 14 \text{ m}$$

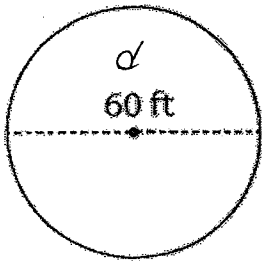
$$A = \pi r^2$$

$$A = \pi (14)^2$$

$$A = 615.7521601$$

$$A = 616 \text{ m}^2$$

3. Find the area of the circle. Leave your answer in terms of  $\pi$ .



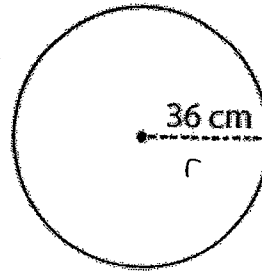
$$r = 30$$

$$A = \pi r^2$$

$$A = \pi (30)^2$$

$$A = 900\pi \text{ ft}^2$$

4. Find the area of the circle. Leave your answer in terms of  $\pi$ .



$$A = \pi r^2$$

$$A = \pi (36)^2$$

$$A = 1296\pi \text{ cm}^2$$

5. A rotating sprinkler that sprays water at a radius of 11 feet is used to water the lawn. Find the area of the lawn that is watered. Round to the *nearest tenth*.

$$A = \pi r^2$$

$$r = 11$$

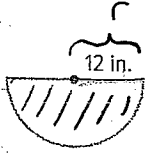
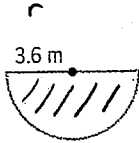
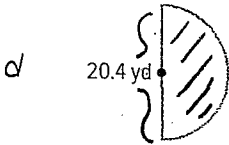
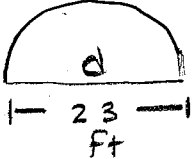
$$A = \underline{\hspace{2cm}}$$

$$A = \pi (11)^2$$

$$A = 380.1327111$$

$$A = 380.1 \text{ ft}^2$$

Find the area of each semicircle. Show all work.

	Leave in terms of $\pi$ .	Round to the nearest tenth.
<p>6.</p> 	$A = \frac{1}{2} \pi r^2$ $A = \frac{1}{2} \pi (12)^2$ $A = 72 \pi \text{ in}^2$	$A = 72 \pi$ $A \approx 226.2 \text{ in}^2$
<p>7.</p> 	$A = \frac{1}{2} \pi r^2$ $A = \frac{1}{2} \pi (3.6)^2$ $A = 6.48 \pi \text{ m}^2$	$A = 6.48 \pi$ $A \approx 20.4 \text{ m}^2$
<p>8.</p>  <p><math>r = 10.2</math></p>	$A = \frac{1}{2} \pi r^2$ $A = \frac{1}{2} \pi (10.2)^2$ $A = 52.02 \pi \text{ yd}^2$	$A = 52.02 \pi$ $A \approx 163.4 \text{ yd}^2$
<p>9. The tunnel opening is a semicircle and has a diameter of 23 feet. Find the area, to the nearest tenth, of the opening of the tunnel enclosed by the semicircle.</p> <p><math>d = 23 \text{ ft}</math></p> <p><math>r = 11.5 \text{ ft}</math></p> 		

$r = 11.5$

$$A = \frac{1}{2} \pi r^2$$

$$A = \frac{1}{2} \pi (11.5)^2$$

$$A = 207.7/378142$$

$$A \approx 207.7 \text{ ft}^2$$