

# Lesson 13.3:

## Areas of Circles

### Essential Question

How can you find the area of a circle?

 **Key Idea**
**Area of a Circle**

**Words** The area  $A$  of a circle is the product of  $\pi$  and the square of the radius.

**Algebra**  $A = \pi r^2$

If you are given  $d$ , you must first divide it by 2 to get  $r$ .

- a. Find the area of the circle. Use  $\frac{22}{7}$  for  $\pi$ .

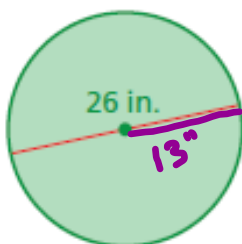


$$\pi r^2$$

$$\frac{22}{7} \cdot 7\text{cm} \cdot 7\text{cm}$$

$$154\text{cm}^2$$

- b. Find the area of the circle. Use 3.14 for  $\pi$ .



$$3.14 \cdot 13\text{in} \cdot 13\text{in}$$

$$530.66\text{in}^2$$

1. Find the area of a circle with a radius of 6 feet. Use 3.14 for  $\pi$ .

$$3.14 \cdot (6\text{ft})^2 = 3.14 \cdot 36\text{ft}^2 = 113.04\text{ft}^2$$

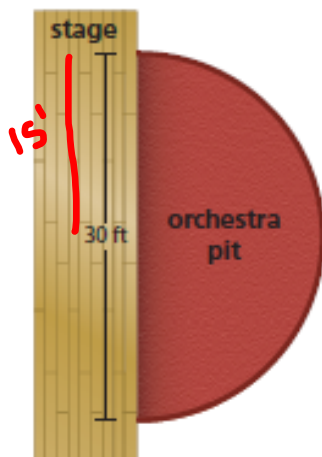
2. Find the area of a circle with a diameter of 28 meters. Use  $\frac{22}{7}$  for  $\pi$ .

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

*Be careful! We need the radius, not the diameter.*

$$\frac{22}{7} \cdot \cancel{14\text{m}} \cdot 14\text{m} = 616\text{m}^2$$

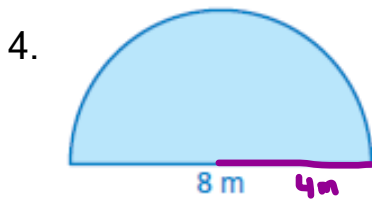
Find the area of the semicircular orchestra pit.



$$\begin{aligned} \frac{1}{2} \pi r^2 &= \frac{1}{2} \cdot 3.14 \cdot (15\text{ft})^2 \\ &= 353.25\text{ft}^2 \end{aligned}$$

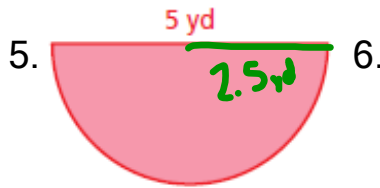
*To find the area of a semicircle, just divide by 2! We don't need to do anything else like we do with perimeter.*

Find the area of the semicircle.



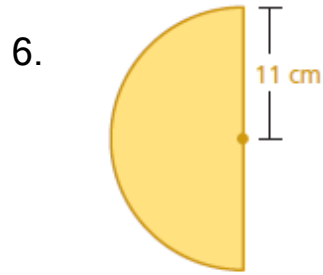
$$\frac{1}{2} \cdot 3.14 \cdot (4\text{m})^2$$

$$25.12 \text{ m}^2$$



$$\frac{1}{2} \cdot 3.14 \cdot (2.5\text{yd})^2$$

$$9.8125 \text{ yd}^2$$



$$\frac{1}{2} \cdot 3.14 \cdot (11\text{cm})^2$$

$$189.97 \text{ cm}^2$$

Find the areas of a 16-inch pizza and a 12-inch pizza. How many times larger is the 16-inch pizza than the 12-inch pizza? (Leave  $\pi$  as  $\pi$ .)

$$16\text{in: } 3.14 \cdot 8^2 = 200.96$$

$$12\text{in: } 3.14 \cdot 6^2 = 113.04$$

To find how many times larger the 16-in is than the 12-in, we need to know how many times the 12-in area goes into the 16-in area, so we divide the 16-in area by the 12-in area.

$$\frac{200.96}{113.04} = 1.\bar{7} \text{ times larger}$$