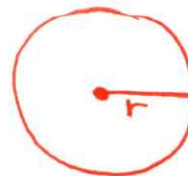


### 13.3 Area of Circles p.566

- Area is the **INSIDE** of an object
- All answers are written as squared (ft<sup>2</sup>, in<sup>2</sup> etc.) *square feet/square inches*
- Squared means the exponent is a 2 (for 2-dimensional objects)

The area (A) of a circle is the product of pi (π) and the square of the radius.

$$A = \pi r^2 \quad \text{or} \quad A = \pi r r$$



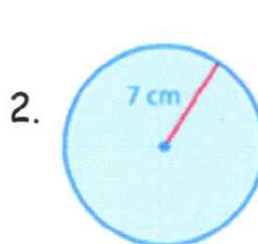
$$r = \frac{1}{2}d \quad \text{or} \quad \frac{d}{2}$$

- Make sure you follow the order of operations and square the radius first (multiply it by itself), then multiply that by pi (use 3.14 or  $\frac{22}{7}$  if the radius is divisible by 7). Remember: the radius is  $\frac{1}{2}$  the diameter.

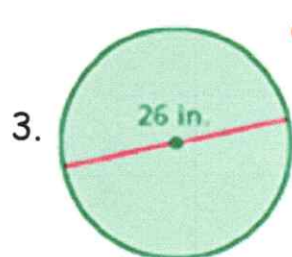
Find the area of each circle:



$$\begin{aligned} &3.14(9)^2 \\ &3.14(81) \\ &\boxed{254.34 \text{ mm}^2} \end{aligned}$$



$$\frac{22}{7} \cdot \frac{7}{1} = \boxed{154 \text{ cm}^2}$$



$$\begin{aligned} &d=26 \quad r=13 \\ &3.14(13)^2 \\ &3.14(169) \\ &\boxed{530.66 \text{ in}^2} \end{aligned}$$



$$\begin{aligned} &3.14(1)^2 \\ &\boxed{3.14 \text{ cm}^2} \end{aligned}$$



$$\begin{aligned} &3.14(10)^2 \\ &3.14(100) \\ &\boxed{314 \text{ in}^2} \end{aligned}$$

6. Find the area of a circle with a radius of 21 feet.

$$\frac{22}{7} \cdot \frac{21^3}{1} \cdot \frac{21}{1} = \boxed{1386 \text{ ft}^2}$$

7. Find the area of a circle with a diameter of 16 meters.

$$(3.14)(8)^2 = \boxed{200.96 \text{ m}^2}$$

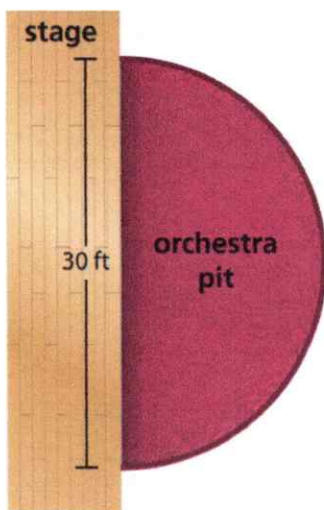
8. Find the area of a circle with a radius of 6 feet.

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

9. Find the area of a circle with a diameter of 28 feet.

$$\frac{22}{7} \cdot \frac{14^2}{1} \cdot \frac{14}{1} = \boxed{616 \text{ ft}^2}$$

Finding the area of a semicircle (p.567) :  $\frac{\pi r^2}{2}$



Find the area of the semicircular orchestra pit.

The area of the orchestra pit is one-half the area of a circle with a diameter of 30 feet.

The radius of the circle is  $30 \div 2 = 15$  feet.

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

Divide the area by 2.

$$\approx \frac{3.14 \cdot 15^2}{2}$$

Substitute 3.14 for  $\pi$  and 15 for  $r$ .

$$= \frac{3.14 \cdot 225}{2}$$

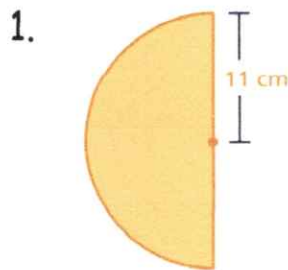
Evaluate  $15^2$ .

$$= 353.25$$

Simplify.

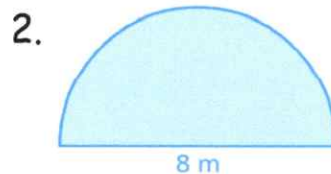
So, the area of the orchestra pit is about 353.25 square feet.

Let's practice finding the area of a semicircle:

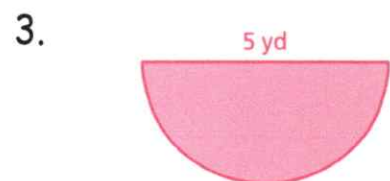


$$\frac{3.14(11)^2}{2} = \frac{379.94}{2}$$

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

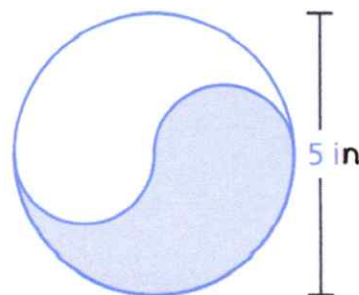


$$\frac{3.14(4)^2}{2} = \boxed{25.12 \text{ m}^2}$$



$$\frac{3.14(2.5)^2}{2} = \boxed{9.8125 \text{ yd}^2}$$

4. Find the area of the shaded region.



$$\frac{3.14(2.5)^2}{2} = \boxed{9.8125 \text{ in}^2}$$