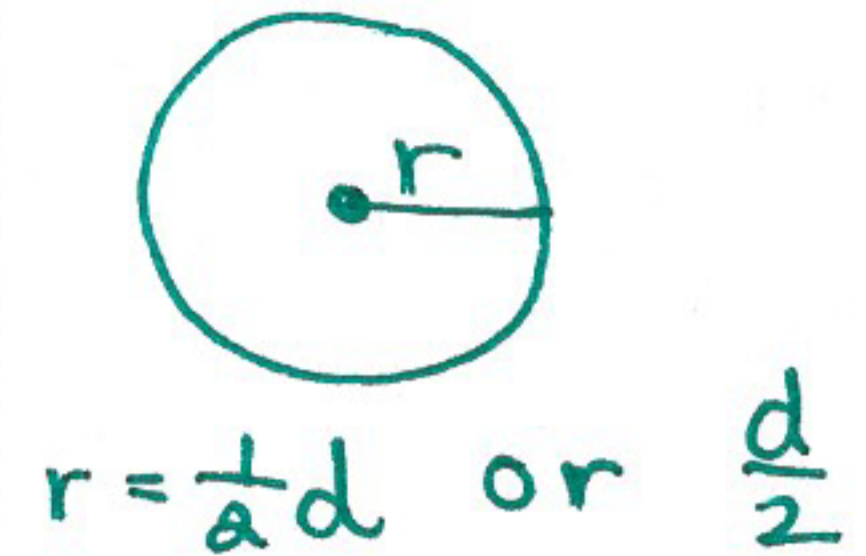


8.3 Area of Circles p.334

- Area is the **INSIDE** of an object
- All answers are written as squared (ft², in² 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.

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



- 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: πr^2 or $\pi r r$

1. 9 mm
 $3.14(9)(9)$
 254.34 mm^2

2. 7 cm
 use $\frac{22}{7}$ for pi
 $\frac{22}{7} \cdot 7 \cdot 7 = \frac{1078}{7} =$
 154 cm^2

3. 26 in.
 $d = 26 \quad r = 13$
 $3.14(13)(13)$
 530.66 in^2

4. 2 cm
 $d = 2 \quad r = 1$
 $3.14(1)(1)$
 3.14 cm^2

5. 10 in.
 $3.14(10)(10)$
 314 in^2

6. Find the area of a circle with a radius of 21 feet.
 use $\frac{22}{7}$
 $\frac{22}{7} \cdot 21 \cdot 21 =$
 $\frac{9702}{7} = 1386 \text{ ft}^2$

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

$$d = 16 \quad r = 8 \quad 3.14(8)(8) = \boxed{200.96 \text{ m}^2}$$

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

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

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

$$d = 28 \quad \text{use } \frac{22}{7} \quad r = 14 \quad \frac{22}{7} \cdot \frac{14}{1} \cdot \frac{14}{1} = \frac{4312}{7} = \boxed{616 \text{ ft}^2}$$

Finding the area of a semicircle (p.335) : $\frac{\pi r^2}{2}$



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 π and 15 for r .

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

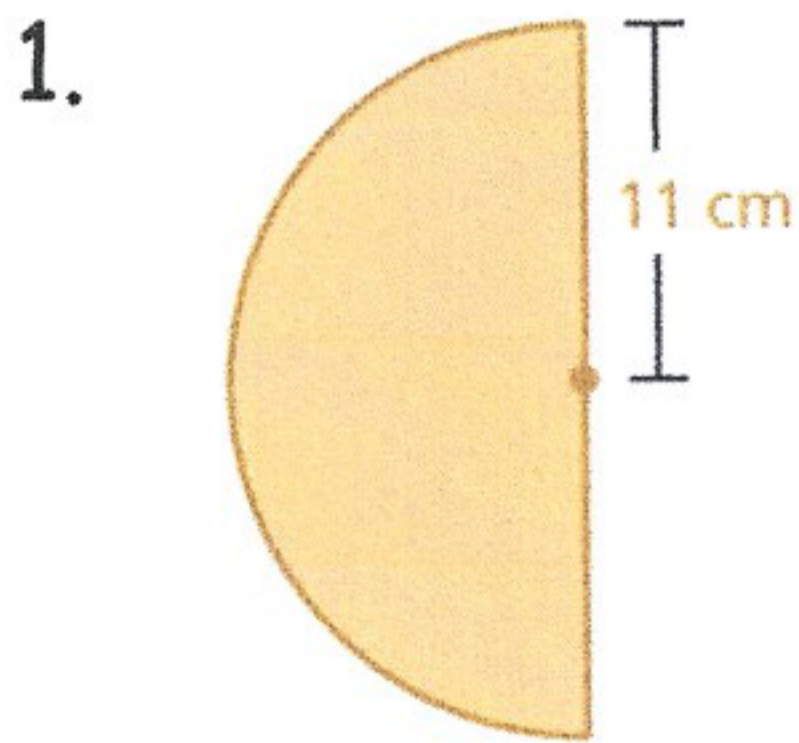
Evaluate 15^2 .

$$= 353.25$$

Simplify.

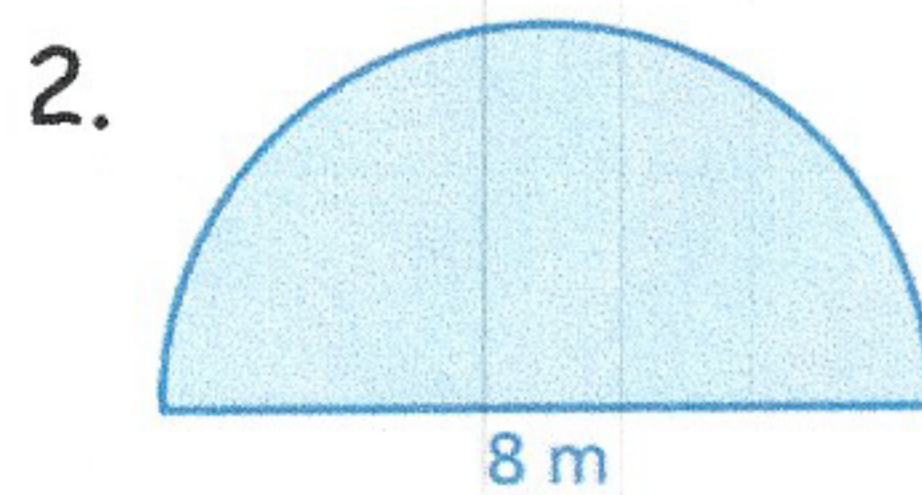
∴ So, the area of the orchestra pit is about 353.25 square feet.

Let's practice finding the area of a semicircle:



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

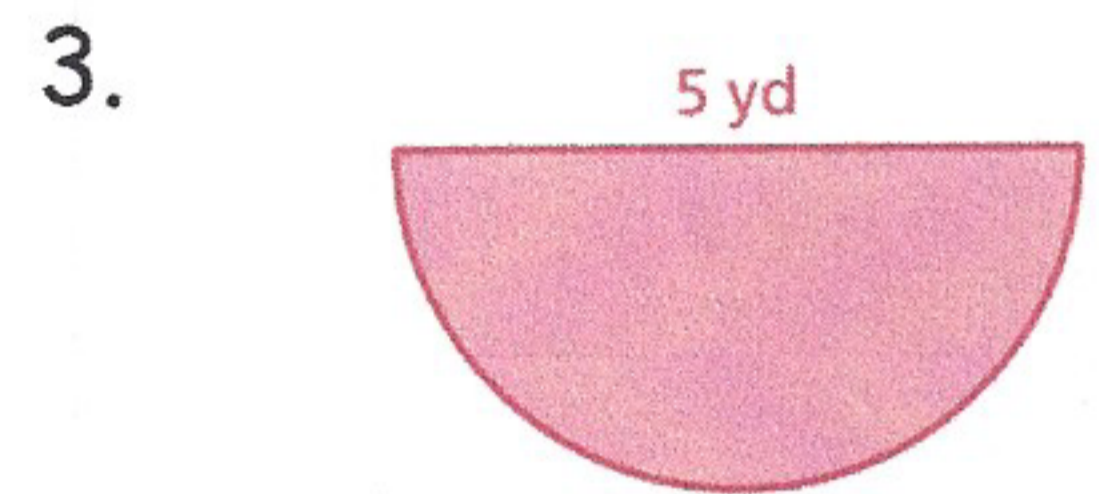
$$\boxed{189.97 \text{ cm}^2}$$



$$d = 8 \quad r = 4$$

$$\frac{3.14(4)(4)}{2}$$

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



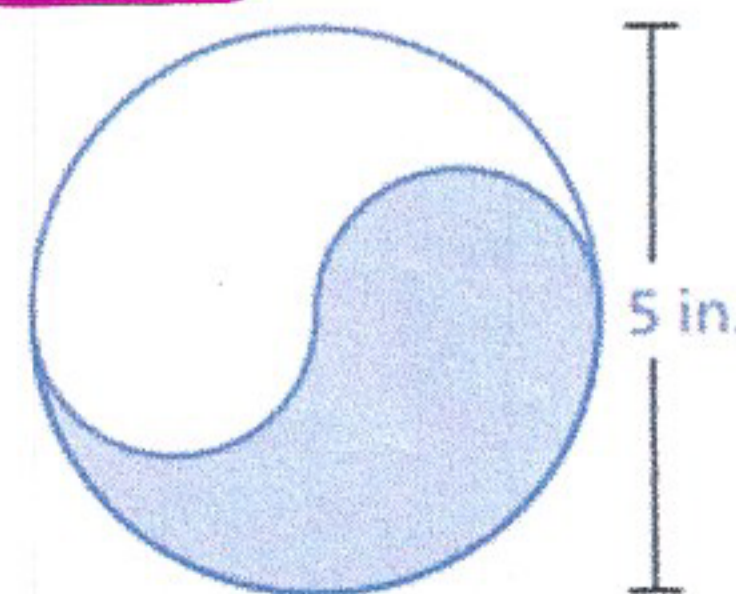
$$d = 5 \quad r = 2.5$$

$$\frac{3.14(2.5)(2.5)}{2}$$

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

4. Find the area of the shaded region.

$\frac{1}{2}$ of it
So $\div 2$



$$d = 5$$

$$r = 2.5$$

Same answer as #3