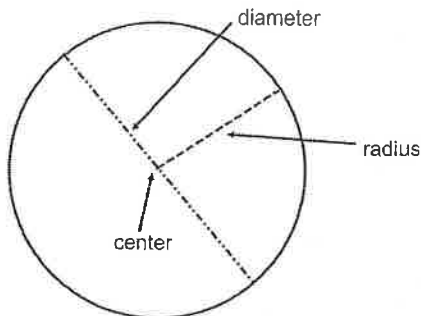


Circumference of Circles

- A circle is all of the points in a plane that are the same distance from a given point called the center.
- The diameter (d) is the distance across the circle through its center.
- The radius (r) is the distance from the center to any point on the circle.
- The circumference (C) is the distance around the circle.



If the diameter of a circle is 7.5 inches, what is the circumference?

Circumference = π times the diameter

3.14 is an approximation for π

The circumference of the circle is about 23.55 inches.

$$C = \pi d$$

$$C \approx 3.14 \cdot 7.5$$

$$C \approx 23.55$$

If the radius of a circle is 14 inches, what is its circumference?

Circumference = two times π times the radius

$\frac{22}{7}$ is also an approximation for π

The circumference of the circle is about 88 inches.

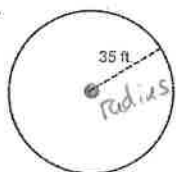
$$C = 2\pi r$$

$$C \approx 2 \cdot \frac{22}{7} \cdot 14$$

$$C \approx 88$$

Find the circumference of each circle. Use 3.14 for π (unless you are using a calculator).

1.



$$C = 2\pi r$$

$$C = 2(3.14)(35)$$

$$C \approx 6.28(35)$$

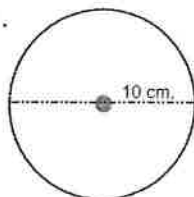
$$C \approx 219.8 \text{ ft.}$$

OR

$$C \approx 2\left(\frac{22}{7}\right)(35)$$

$$C \approx 220 \text{ ft.}$$

2.

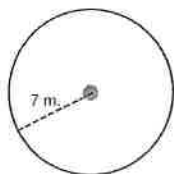


$$C = \pi d$$

$$C \approx 3.14(10)$$

$$C \approx 31.4 \text{ cm}$$

3.



$$C = 2\pi r$$

$$C = 2 \cdot \frac{22}{7} \cdot 7$$

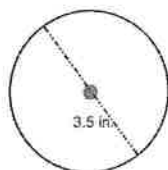
$$C \approx 44 \text{ m}$$

OR

$$C = 2(3.14)(7)$$

$$C \approx 43.96 \text{ m}$$

4.



$$C = \pi d$$

$$C \approx 3.14(3.5)$$

$$C \approx 10.99 \text{ in.}$$

5. $r = 5\frac{1}{2}$ cm.

$$C = 2\pi r$$

$$C \approx 2(3.14)(5\frac{1}{2})$$

$$C \approx 34.54 \text{ cm}$$

6. $d = 5$ km.

$$C = \pi d$$

$$C = 3.14(5)$$

$$C \approx 15.7 \text{ km}$$

7. $r = 12\frac{3}{4}$ ft.

$$C = 2\pi r$$

$$C \approx 2\left(\frac{22}{7}\right)\left(\frac{51}{4}\right)$$

$$C \approx \frac{1122}{14}$$

$$C \approx 80\frac{1}{7} \text{ ft.}$$

8. $d = 6.3$ m.

$$C = \pi d$$

$$C \approx 3.14(6.3)$$

$$C \approx 19.782 \text{ m}$$

9. What is the diameter of a circle whose radius is $8\frac{2}{3}$ meters long?

$$r = 8\frac{2}{3} \text{ m}$$

$$d = 2\left(8\frac{2}{3}\right) \text{ m}$$

$$d = 2 \cdot \frac{26}{3}$$

$$d = \frac{52}{3}$$

$$d = 17\frac{1}{3} \text{ m.}$$

10. What is the radius of a circle whose diameter is 20.35 centimeters long?

radius

$$d = 20.35$$

$$r = \frac{1}{2}(20.35)$$

$$r = 10.175 \text{ cm}$$

Area of Circles

○ The area of a circle is equal to pi (π) times the square of the radius of the circle.

$$A = \pi r^2$$

Example: Find the area of the circle shown at the right.

First you have to find the radius

$$r = \frac{1}{2}d$$

$$r = \frac{1}{2}(250)$$

$$r = 125$$

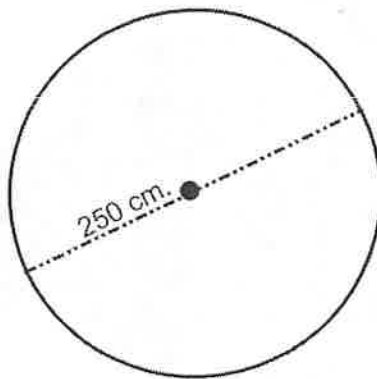
Then you find the area

$$A = \pi r^2$$

$$A = \pi(125^2)$$

$$A = \pi(15,625)$$

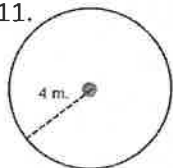
$$A \approx 49,062.5$$



The area of the circle is about 49,062.5 sq. cm.

Find the area of each circle shown or described below. Show all work.

11.

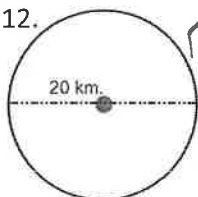


$$A = \pi r^2$$

$$A = 3.14(4)(4)$$

$$A = 50.24 \text{ sq. m}$$

12.



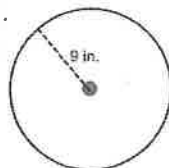
$r = 10 \text{ km}$

$$A = \pi r^2$$

$$A = 3.14(10)(10)$$

$$A = 314 \text{ sq km}$$

13.

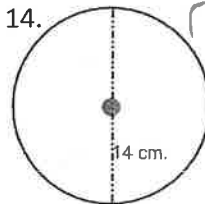


$$A = \pi r^2$$

$$A = 3.14(9)(9)$$

$$A = 254.34 \text{ sq in}$$

14.



$r = 7 \text{ cm}$

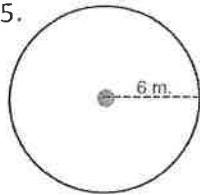
$$A = \pi r^2$$

$$A = \frac{22}{7} \cdot \frac{7}{1} \cdot \frac{7}{1}$$

$$A = 154 \text{ sq. cm}$$

Find the area of each circle shown below. Round answers to the nearest hundredth. Show all work.

15.

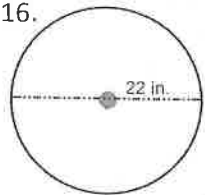


$$A = \pi r^2$$

$$A = 3.14(6)(6)$$

$$A = 113.04 \text{ sq. m}$$

16.



$r = 11 \text{ in}$

$$A = \pi r^2$$

$$A = 3.14(11)(11)$$

$$A = 379.94 \text{ sq. in.}$$

17.



$r = 11.5$

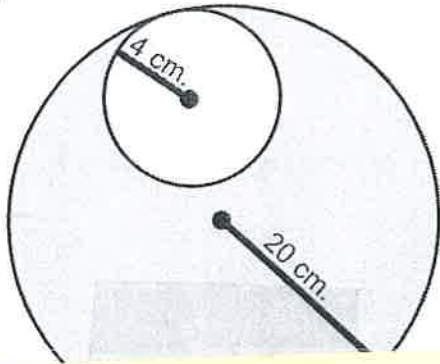
$$A = \pi r^2$$

$$A = 3.14(11.5)(11.5)$$

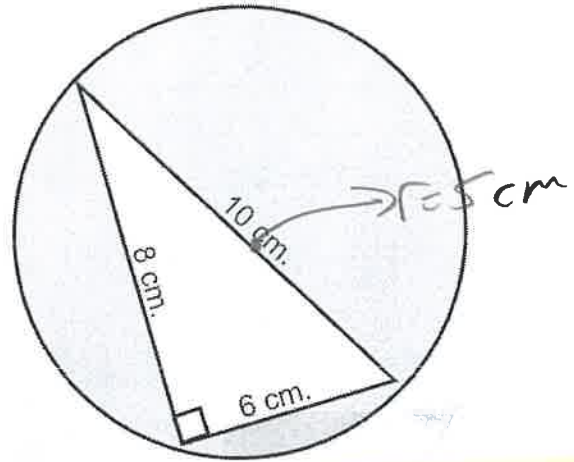
$$A = 415.27 \text{ sq. ft.}$$

Find the shaded region. Show all formal work.

1.



2.



* Shaded 1205.76 sq. cm

$$(\text{shaded}) = (\text{Area Big Cir}) - \text{Area small circle}$$

$$A_s = \pi r^2 + \pi r^2$$

$$A_s = [3.14(20)(20)] - [3.14(4)(4)]$$

$$A_s = 1256 - 50.24$$

$$A_s = 1205.76 \text{ sq. cm}$$

Shaded 54.5 sq. cm

$$* A_{\text{shad}} = (\text{Area Circle}) - (\text{Area Triangle})$$

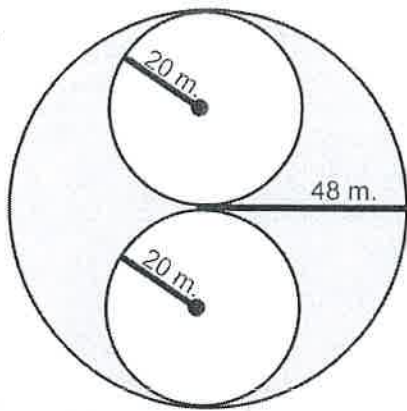
$$A_s = \pi r^2 - \frac{1}{2}bh$$

$$A_s = [3.14(5)(5)] - [\frac{1}{2}(6)(8)]$$

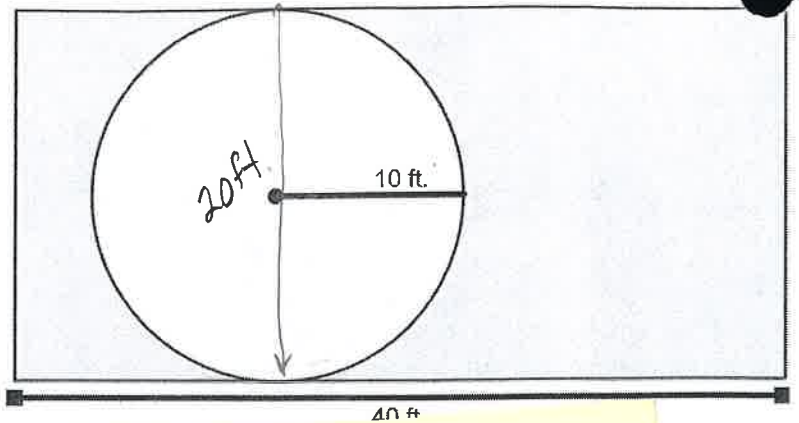
$$A_s = 78.5 - 24$$

$$A_s = 54.5 \text{ sq. cm}$$

3.



4.



Shaded 4722.56 sq. m

Shaded 486 sq. ft.

$$A_s = (\text{Area}_{\text{big}}) - 2 [\text{Area of Small } O_s]$$

$$A_s = \pi r^2 - 2 [\pi r^2]$$

$$A_s = 3.14(48)(48) - 2 [3.14(20)(20)]$$

$$A_s = 7234.56 - 2512$$

$$A_s = 4722.56 \text{ sq. m.}$$

$$(A_{\text{shaded}}) = (A_{\square}) - (A_{\circ})$$

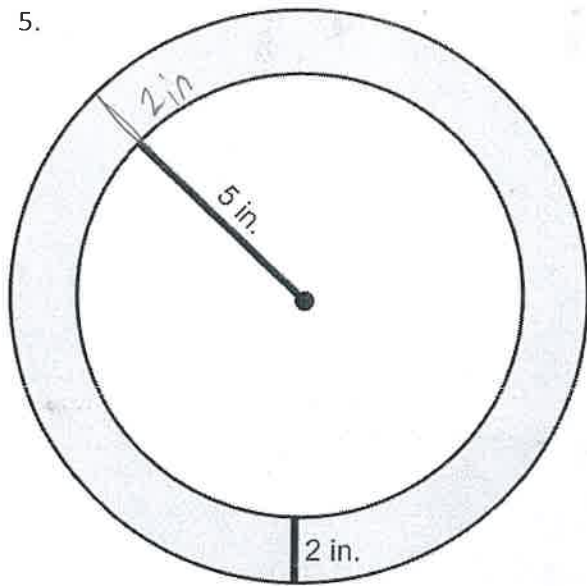
$$A_s = bh - \pi r^2$$

$$A_s = 40(20) - [3.14(10)(10)]$$

$$A_s = 800 - 314$$

$$A_s = 486 \text{ sq. ft.}$$

5.



(Area big circle) - (Area Small)

$$A_s = \pi r^2 - \pi r^2$$

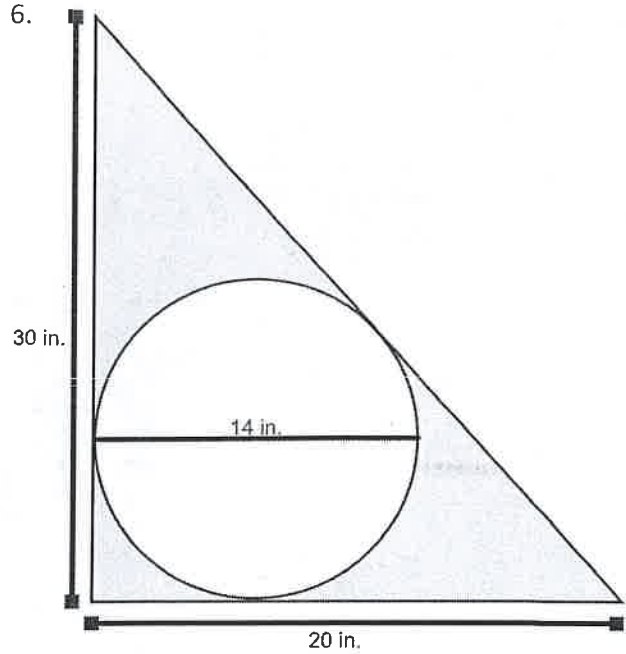
$$A_s = \frac{22}{7} (7)(7) - 3.14 (5)(5)$$

$$A_s = 154 - 78.5$$

$$A_s = 75.5 \text{ sq in}$$

Shaded 75.5 sq in

6.



$$A_s = \frac{1}{2}bh - \pi r^2$$

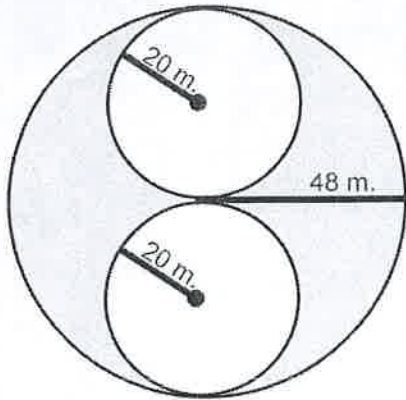
$$A_s = \frac{1}{2}(20)(30) - \frac{22}{7} (7)(7)$$

$$A_s = 300 - 154$$

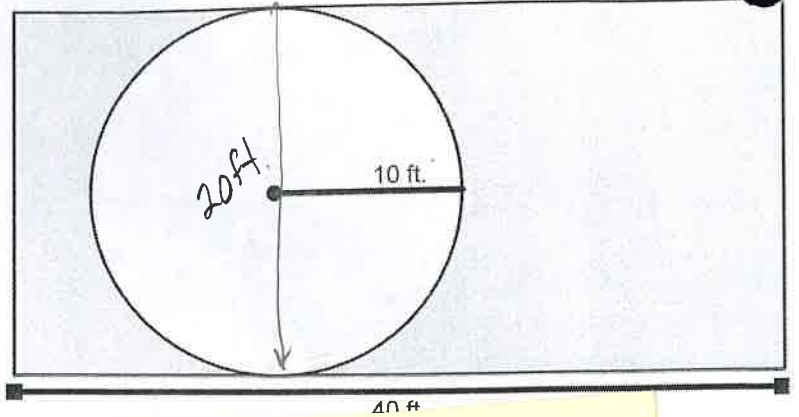
$$A_s = 146 \text{ sq in.}$$

Shaded 146 sq in

3.



4.



Small
2
20(20)
16

Circle
 πr^2
 $3.14(10)(10)$
1

Shaded 4722.56 sq. m

Shaded 486 sq. ft.

$$A_s = (\text{Area big}) - 2 [\text{Area of small Os}]$$

$$A_s = \pi r^2 - 2 [\pi r^2]$$

$$A_s = 3.14(48)(48) - 2 [3.14(20)(20)]$$

$$A_s = 7234.56 - 2512$$

$A_s = 4722.56 \text{ sq. m.}$

$$(A_{\text{shaded}}) = (A_{\square}) - (A_{\circ})$$

$$A_s = bh - \pi r^2$$

$$A_s = 40(20) - [3.14(10)(10)]$$

$$A_s = 800 - 314$$

$A_s = 486 \text{ sq. ft.}$