

AREA of a Circle

Key

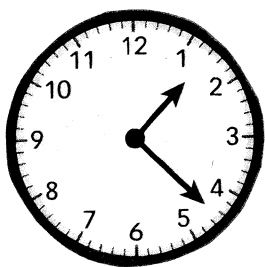
The area of a circle is the number of square units inside the circle. The formula for the area of a circle is below.

$$A = \pi \cdot r^2$$

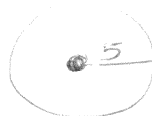
"A" stands for the area of the circle and "r" stands for the radius of the circle. So, the area of a circle is equal to π times the radius squared or $\pi \times \text{radius} \times \text{radius}$!

Let's try some examples.

1. A clock face has a diameter of 10 inches. What is the area of the face of the clock?
Round your answer to the nearest hundredth.



$$\begin{aligned} A &= \pi r^2 \\ A &= \pi (5^2) \\ A &= 25\pi \\ A &\approx 78.54 \text{ in}^2 \end{aligned}$$



2. A biscuit recipe calls for the dough to be rolled out and circles to be cut from the dough. The biscuit cutter has a radius of four centimeters. Find the area of the bottom of the biscuit once it is cut. Round your answer to the nearest hundredth.



$$\begin{aligned} A &= \pi r^2 \\ A &= \pi (4^2) \\ A &= 16\pi \end{aligned} \rightarrow A \approx 50.27 \text{ cm}^2$$

3. A circular pool has a radius of 10 feet. What is the area of the surface of the water in the pool to the nearest tenth?



$$\begin{aligned} A &= \pi r^2 \\ A &= \pi 10^2 \\ A &= 100\pi \end{aligned} \rightarrow A \approx 314.2 \text{ ft}^2$$

4. A stained glass window is shaped like a semicircle. The bottom edge of the window is 36 inches long. What is the area of the stained glass window? Round your answer to the nearest hundredth.



$$36 \div 2 = 18$$

full circle

$$A = \pi r^2$$

$$A = \pi (18^2)$$

$$A = 324\pi$$

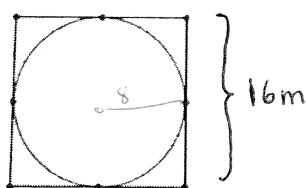
$$A \approx 1017.88 \text{ in}^2$$

half circle

$$A = \frac{1017.88}{2}$$

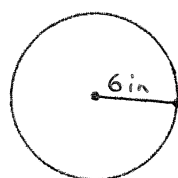
$$A = 508.94 \text{ in}^2$$

5. Find the area of the circles below. Leave your answers in terms of π .



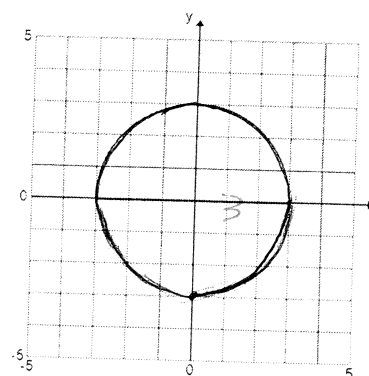
$$A = \pi r^2$$

$$A = 64\pi \text{ meters}^2$$



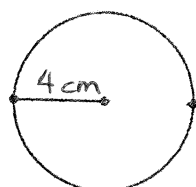
$$A = \pi r^2$$

$$A = 36\pi \text{ in}^2$$



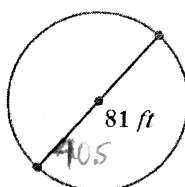
$$A = \pi r^2$$

$$A = 9\pi \text{ units}^2$$



$$A = \pi r^2$$

$$A = 16\pi \text{ cm}^2$$

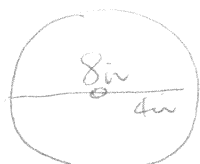


$$A = \pi r^2$$

$$A = (40.5)^2 \pi$$

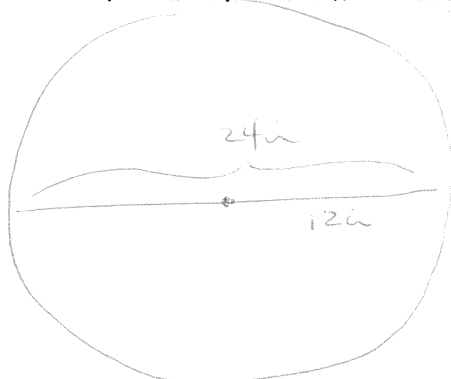
$$A = 1640.25\pi \text{ ft}^2$$

6. A bakery offers a small circular cake with a diameter of 8 inches. It also offers a large circular cake with a diameter of 24 inches. Does the top of the large cake have three times the area of that of the small cake? If not, how much greater is its area? Explain.



$$A = \pi r^2$$

$$A = 16\pi$$



$$A = \pi r^2 = 144\pi$$

$$\frac{144\pi}{16\pi} = 9$$

The large cake is 9 times the size of the smaller cake.

(We know this bc the area changes by the square of how the diameter.)