

Lesson 10-9

Problem

RECREATION A swimming pool is shaped like a cylinder. The pool is 4 ft deep and has a radius of 12 ft. There is a 2-ft wide gravel walkway around the base of the pool.

- About how many sheets of metal siding will be needed to build the sides of the pool if each sheet has an area of 24 ft^2 ?
- What is the perimeter of the outer edge of the gravel walkway?
- How many gallons of water does the pool hold? (The volume of 1 gal is approximately 0.1337 ft^3 .)

Solution

- Find the surface area of the sides of the pool.

$$SA = 2\pi rh$$

$$SA \approx 2 \cdot 3.14 \cdot 12 \cdot 4$$

$$SA \approx 301.44$$

The surface area of the sides of the pool is approximately 301.44 ft^2 . Since each sheet of metal covers 24 ft^2 , divide the surface area by 24.

$$301.44 \div 24 \approx 12.6$$

It will take approximately 12.6 sheets to build the sides of the pool.

- The perimeter of the walkway is the circumference of a circle with radius $12 + 2 = 14$ ft.

$$C = 2\pi r$$

$$C \approx 2 \cdot 3.14 \cdot 14$$

$$C \approx 87.92$$

The gravel walkway has a circumference of approximately 87.92 ft.

- The number of gallons the pool will hold is the volume of the pool.

$$V = \pi r^2 h$$

$$V \approx 3.14 \cdot 12^2 \cdot 4$$

$$V \approx 1808.64$$

The volume is approximately 1808.64 ft^3 . Since the volume of 1 gal is approximately 0.1337 ft^3 , the pool holds approximately $1808.64 \div 0.1337 \approx 13,527.6$ gal.