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Module 13 Perimeter, Area, and Volume

Lesson 4 Surface Area: Prisms, Cylinders, and Spheres

Lesson Notes

13.4

Lesson Objectives

- Derive and use formulas for surface area of prisms, cylinders, and spheres.
- Use square units to find the surface area of prisms, cylinders, and spheres.

Subtopic 1 Surface Area of a Prism

Surface Area (SA) of Any Solid

Equals the total area of its **faces**

Measured in **square units**

Surface Area of a Rectangular Prism

$$SA = 2(lw) + 2(wh) + 2(lh)$$

Surface Area of a Triangular Prism

$$SA = 2B + L$$

“ B ” refers to **base** of triangular prism.

“ L ” refers to **lateral** area.

Lateral area is the **sum** of the areas of the lateral **faces** of a triangular prism.

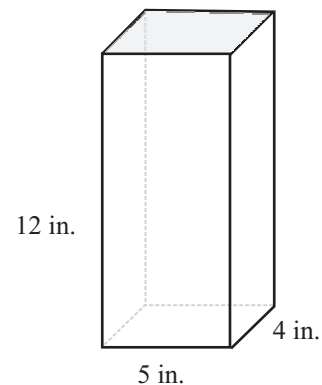
- 1** Find the surface area of the rectangular prism.

$$SA = 2(lw) + 2(wh) + 2(lh)$$

$$SA = 2(5 \text{ in.} \times 4 \text{ in.}) + 2(4 \text{ in.} \times 12 \text{ in.}) + 2(5 \text{ in.} \times 12 \text{ in.})$$

$$SA = 40 \text{ in.}^2 + 96 \text{ in.}^2 + 120 \text{ in.}^2$$

$$SA = 256 \text{ in.}^2$$



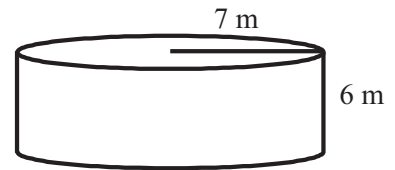
Subtopic 2 Surface Area of a Cylinder

Surface Area of a Cylinder

$$SA = 2\pi r^2 + \underline{2\pi rh}$$

- 2 Find the surface area of the cylinder.

$$\begin{aligned}SA &= 2\pi r^2 + 2\pi rh \\SA &= 2 \times 3.14 \times 7^2 + 2 \times 3.14 \times 7 \times 6 \\SA &= 307.72 \text{ m}^2 + 263.76 \text{ m}^2 \\SA &\approx 571.48 \text{ m}^2\end{aligned}$$



Subtopic 3 Surface Area of a Sphere

Surface Area of a Sphere

$$SA = \underline{4\pi r^2}$$

- 3 Find the surface area of the sphere.

$$\begin{aligned}SA &= 4\pi r^2 \\SA &= 4 \times 3.14 \times (6 \text{ cm})^2 \\SA &\approx 452.16 \text{ cm}^2\end{aligned}$$

