

Surface Area and Volume TEKS 8.8.B, 8.8.C, G.8.D

A **solid** is a three-dimensional figure that encloses part of space.

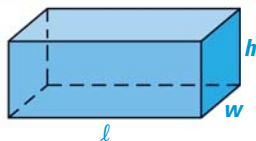
The **surface area** S of a solid is the area of the solid's outer surface(s).

The **volume** V of a solid is the amount of space that the solid occupies.

Rectangular Prism

$$S = 2lw + 2lh + 2wh$$

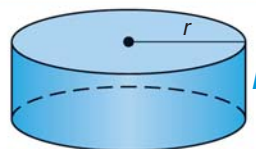
$$V = lwh$$



Cylinder

$$S = 2\pi r^2 + 2\pi rh$$

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



EXAMPLE

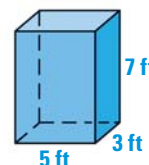
Find the surface area and volume of the rectangular prism.

Surface area

$$\begin{aligned} S &= 2lw + 2lh + 2wh \\ &= 2(5)(3) + 2(5)(7) + 2(3)(7) \\ &= 30 + 70 + 42 \\ &= 142 \text{ ft}^2 \end{aligned}$$

Volume

$$\begin{aligned} V &= lwh \\ &= (5)(3)(7) \\ &= 105 \text{ ft}^3 \end{aligned}$$



EXAMPLE

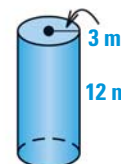
Find the surface area and volume of the cylinder.

Surface area

$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(3)^2 + 2\pi(3)(12) \\ &= 90\pi \text{ m}^2 && \text{Exact answer} \\ &\approx 283 \text{ m}^2 && \text{Approximate answer} \end{aligned}$$

Volume

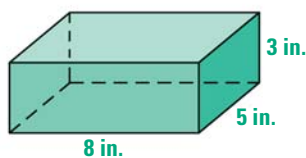
$$\begin{aligned} V &= \pi r^2 h \\ &= \pi(3)^2(12) \\ &= 108\pi \text{ m}^3 && \text{Exact answer} \\ &\approx 339 \text{ m}^3 && \text{Approximate answer} \end{aligned}$$



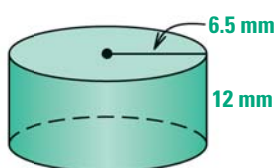
PRACTICE

Find the surface area and volume of the solid.

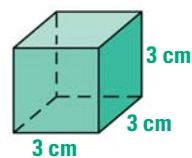
1.



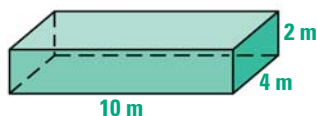
2.



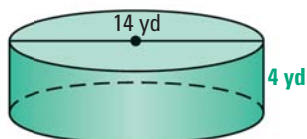
3.



4.



5.



6.

