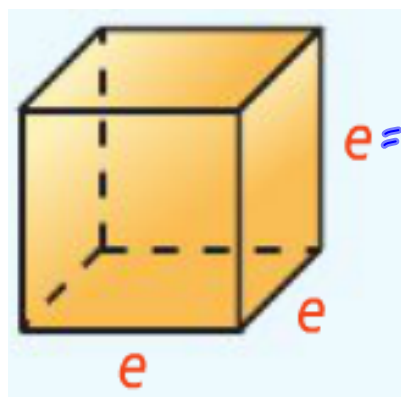


Geometry

Chapter 11

Section 11-4

Volume is the space that a figure occupies. It is measured in cubic units such as cubic inches (in.^3), cubic feet (ft^3), or cubic centimeters (cm^3). The volume V of a cube is the cube of the length of its edge e , or $V = e^3$.



$$e = 2\text{m}$$

$$V = (2\text{m})^3$$
$$8\text{m}^3$$

One stack of construction paper is leaning to the left. It is straightened so all lateral edges are vertical.

- Does the stack still have the same number of sheets?
- Does the stack still have the same volume?

Yes

Yes

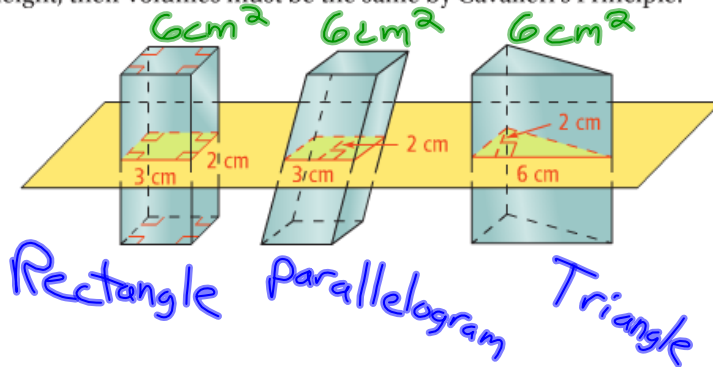


Take note

Theorem 11-5 Cavalieri's Principle

If two space figures have the same height and the same cross-sectional area at every level, then they have the same volume.

The area of each shaded cross section below is 6 cm^2 . Since the prisms have the same height, their volumes must be the same by Cavalieri's Principle.

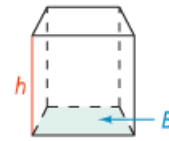


take note

Theorem 11-6 Volume of a Prism

The volume of a prism is the product of the area of the base and the height of the prism.

$$V = Bh$$

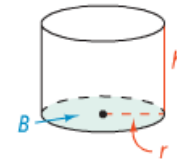


take note

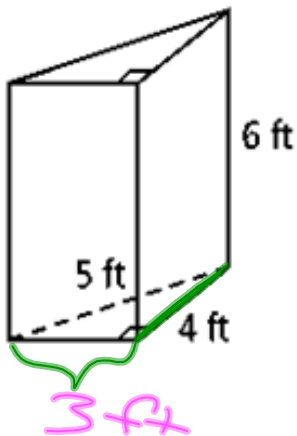
Theorem 11-7 Volume of a Cylinder

The volume of a cylinder is the product of the area of the base and the height of the cylinder.

$$V = Bh, \text{ or } V = \pi r^2 h$$



Find the volume of the figure.



$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 3 \cdot 4\right) (6 \text{ ft})$$

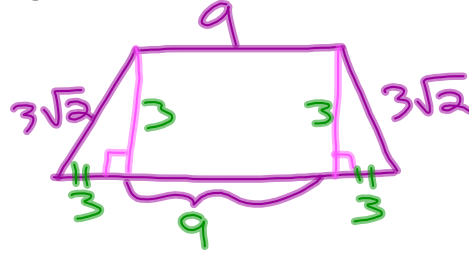
$$(6 \text{ ft}^2) (6 \text{ ft})$$

$$V = 36 \text{ ft}^3$$

Find the volume of a prism with a height of 7 cm whose base is an isosceles trapezoid with base edges 9 cm and 15 cm and legs $3\sqrt{2}$ cm.

$$V = Bh$$

$$(36)(7)$$

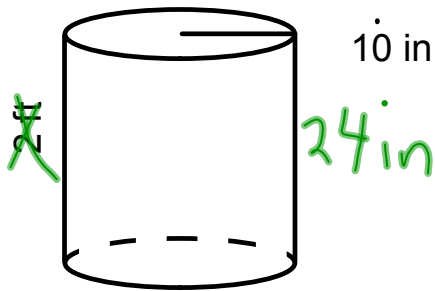


15

$$B = \frac{1}{2}(3)(9+15)$$

$$= 36$$

Find the volume of the figure. Round to the nearest tenth.



$$V = Bh$$

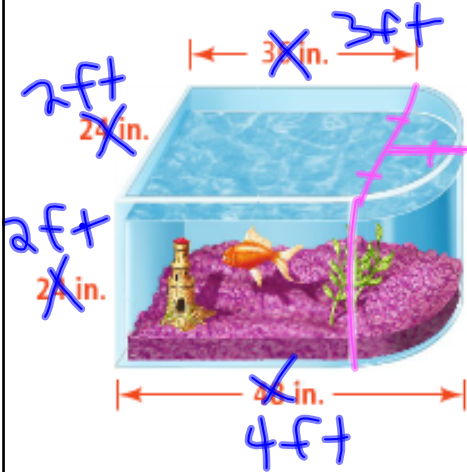
$$V = \pi r^2 h$$

$$V = \pi(10)^2(24)$$

$$V = 2400\pi \text{ in}^3$$

$$V \approx 7539.8 \text{ in}^3$$

Find the exact volume of the aquarium.



Prism + $\frac{1}{2}$ cylinder

$$V = (2)(2)(3) + \frac{1}{2} \pi (1)^2 (2)$$

$$V = 12 + \pi \text{ ft}^3$$

Homework

Pages 721 - 722

6 - 18 all, 40, 41