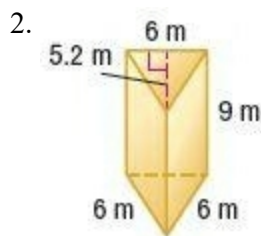


10-2 Volume of Triangular Prisms

Find the volume of the prism. Round to the nearest tenth if necessary.



SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 6 \cdot 5.2 \right) (9)$$

$$V = 140.4$$

The volume of the prism is 140.4 cubic meters.

ANSWER:

$$140.4 \text{ m}^3$$

4. A wheelchair ramp is in the shape of a triangular prism. It has an area of 37.4 square yards and a height of 5 yards. Find the volume of the ramp.

SOLUTION:

$$V = Bh$$

$$V = (37.4)(5)$$

$$V = 187$$

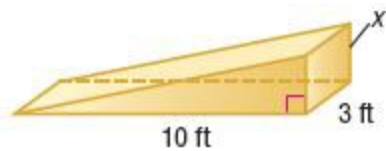
The volume of the ramp is 187 cubic yards.

ANSWER:

$$187 \text{ yd}^3$$

10-2 Volume of Triangular Prisms

Find the missing dimension of the triangular prism.



6. $V = 30 \text{ ft}^3$

SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 10 \cdot x\right)3$$

$$30 = (5 \cdot x)3$$

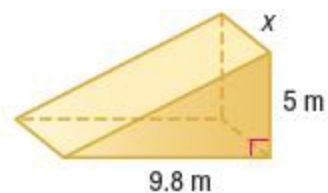
$$30 = 15x$$

$$2 = x$$

So, the missing side is 2 ft.

ANSWER:

2 ft



8. $V = 98 \text{ m}^3$

SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 5 \cdot 9.8\right)x$$

$$98 = \left(\frac{1}{2} \cdot 49\right)x$$

$$98 = 24.5x$$

$$4 = x$$

So, the missing side is 4 m.

ANSWER:

4 m

10-2 Volume of Triangular Prisms

10. **Be Precise** Darcy built the dollhouse shown.

- What is the volume of the first floor?
- What is the volume of the attic space?



SOLUTION:

- The first floor is a rectangular prism.

$$V = bwh$$

$$V = 45 \cdot 20 \cdot 10$$

$$V = 9,000$$

The volume of the first floor is 9,000 cubic inches.

- The attic space is a triangular prism.

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 20 \cdot 8 \right) (45)$$

$$V = 3,600$$

The volume of the attic space is 3,600 cubic inches.

ANSWER:

- 9,000 in³
- 3,600 in³

10-2 Volume of Triangular Prisms

12. **Identify Repeated Reasoning** A rectangular prism and a triangular prism each have a volume of 210 cubic meters. Find possible sets of dimensions for each prism.

SOLUTION:

Sample answer: Rectangular prism: length, 7 meters; width, 5 meters; height, 6 meters; triangular prism: area of base, 35 square meters; height, 6 meters

Rectangular Prism

$$V = bwh$$

$$210 = 7 \cdot 3 \cdot 10$$

$$= 7 \cdot 5 \cdot 6$$

$$= 15 \cdot 2 \cdot 7$$

Triangular Prism

$$V = \left(\frac{1}{2}bh\right)(h)$$

$$210 = \left(\frac{1}{2} \cdot 7 \cdot 6\right)(10)$$

$$= \left(\frac{1}{2} \cdot 7 \cdot 10\right)(6)$$

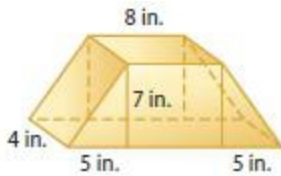
$$= \left(\frac{1}{2} \cdot 7 \cdot 2\right)(30)$$

ANSWER:

Sample answer: Rectangular prism: length, 7; width, 5; height, 6; triangular prism: area of base, 35 sq. meters; height, 6 meters

10-2 Volume of Triangular Prisms

14. **Persevere with Problems** Explain a method you could use to find the volume of the prism below. Then find the volume of the prism.



SOLUTION:

Sample answer: The formula for the volume of a prism is $V = Bh$, where B is the area of the base. Since the base is a trapezoid, replace B with $\frac{1}{2}h(b_1 + b_2)$, substitute, and simplify;

$$V = Bh$$

$$V = \frac{1}{2}h(b_1 + b_2)h$$

$$V = \frac{1}{2} \cdot 7(18 + 8)4$$

$$V = 364$$

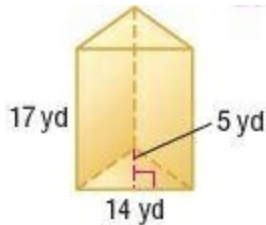
The volume is 364 in^3

ANSWER:

Sample answer: The formula for the volume of a prism is $V = Bh$, where B is the area of the base. Since the base is a trapezoid, replace B with $\frac{1}{2}h(b_1 + b_2)$, substitute, and simplify; 364 in^3

Find the volume of each prism. Round to the nearest tenth if necessary.

16.



SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 14 \cdot 5 \right) (17)$$

$$V = 595$$

The volume of the prism is 595 cubic yards.

ANSWER:

$$595 \text{ yd}^3$$

10-2 Volume of Triangular Prisms

18. A candle is in the shape of a triangular prism. The base has an area of 30 square inches. The candle has a height of 6 inches. Find the volume of the candle.

SOLUTION:

$$V = Bh$$

$$V = (30)(6)$$

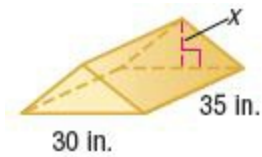
$$V = 180$$

The volume of the candle is 188 cubic inches.

ANSWER:

$$180 \text{ in}^3$$

Find the missing dimension of the triangular prism.



20. $V = 6,300 \text{ in}^3$

SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 30 \cdot x\right) 35$$

$$6,300 = (15 \cdot x) 35$$

$$6,300 = 525x$$

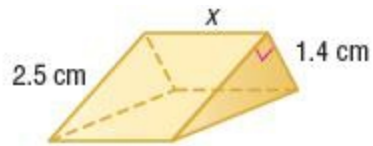
$$12 = x$$

So, the missing side is 12 in.

ANSWER:

$$12 \text{ in.}$$

10-2 Volume of Triangular Prisms



22. $V = 3.5 \text{ cm}^3$

SOLUTION:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 1.4 \cdot 2.5\right)x$$

$$3.5 = (1.75)x$$

$$2 = x$$

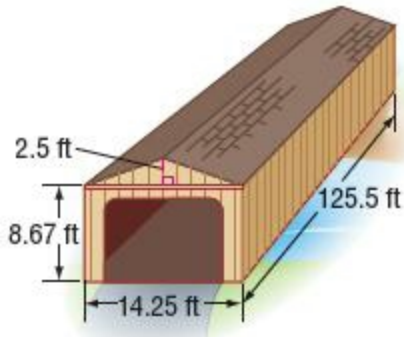
So, the missing side is 2 centimeters.

ANSWER:

2 cm

10-2 Volume of Triangular Prisms

24. **Be Precise** A covered bridge in Vermont has the dimensions shown.
- What is the volume of the bottom section rounded to the nearest tenth?
 - What is the volume of the roof, rounded to the nearest tenth?



SOLUTION:

- a. The bottom section is a rectangular prism.

$$V = bwh$$

$$V = 14.25 \cdot 125.5 \cdot 8.67$$

$$V = 15,505.2$$

The volume of the bottom is 15,505.2 cubic feet.

- b. The top section is a triangular prism.

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 14.25 \cdot 2.5\right)(125.5)$$

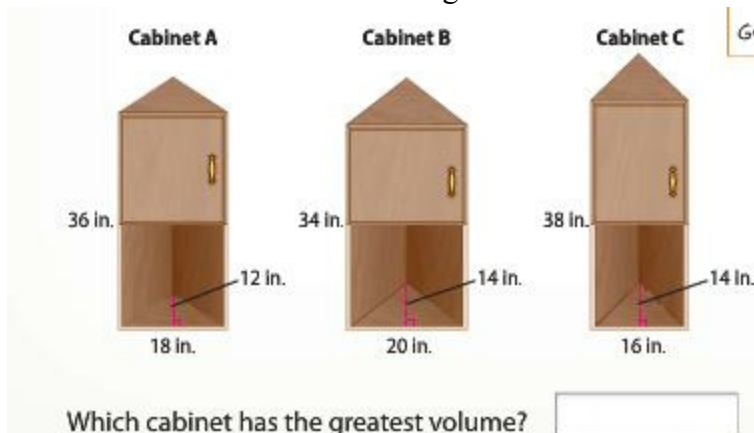
$$V = 2,235.5$$

The volume of the attic space is 2,235.5 cubic feet.

ANSWER:

- 15,505.2 ft³
- 2,235.5 ft³

26. A kitchen cabinet manufacturer offers three different size corner cabinets with the dimension shown below. Sort the volume of the cabinets from least to greatest.



10-2 Volume of Triangular Prisms

	Cabinet	Volume (in ³)
Least		
Greatest		

SOLUTION:

Volume of cabinet A:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 18 \cdot 12\right)(36)$$

$$V = (108)(36)$$

$$V = 3,888$$

The volume of cabinet A is 3,888 cubic inches.

Volume of cabinet B:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 20 \cdot 14\right)(34)$$

$$V = (140)(34)$$

$$V = 4,760$$

The volume of cabinet B is 4,760 cubic inches.

Volume of cabinet C:

$$V = Bh$$

$$V = \left(\frac{1}{2} \cdot 16 \cdot 14\right)(38)$$

$$V = (112)(38)$$

$$V = 4,256$$

The volume of cabinet C is 4,256 cubic inches.

Now sort the volumes from least to greatest.

	Cabinet	Volume (in ³)
Least	A	3,888
	C	4,256
Greatest	B	4,760

The volume of cabinet B is the greatest.

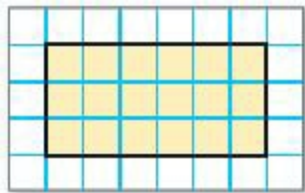
ANSWER:

10-2 Volume of Triangular Prisms

	Cabinet	Volume (in ³)
Least	A	3,888
	C	4,256
Greatest	B	4,760

Cabinet B

Find the area of the figure.



28.

SOLUTION:

The formula for the area of a rectangle is $A = lw$. Find the length and the width.

$$A = lw$$

$$A = (6)3$$

$$A = 18$$

The area of the figure is 18 units².

ANSWER:

18 units²

30. Sarah is building a birdhouse. The nails she uses are one inch long. The wood board is 1 foot long. How many times smaller are the nails compared to the wood?

SOLUTION:

One foot is 12 inches, so one inch is 12 times smaller than one foot. The nails are 12 times smaller than the wood.

ANSWER:

12 times