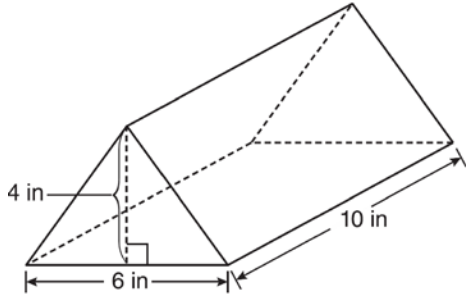


**G.GMD.A.3: Volume 1**

- 1 A packing carton in the shape of a triangular prism is shown in the diagram below.



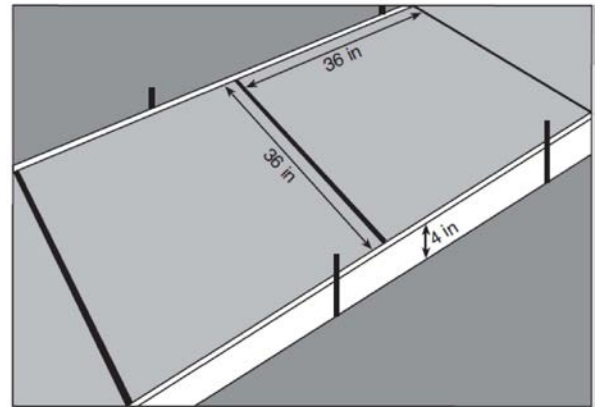
What is the volume, in cubic inches, of this carton?

- 1) 20  
2) 60  
3) 120  
4) 240
- 2 A sandbox in the shape of a rectangular prism has a length of 43 inches and a width of 30 inches. Jack uses bags of sand to fill the sandbox to a depth of 9 inches. Each bag of sand has a volume of 0.5 cubic foot. What is the minimum number of bags of sand that must be purchased to fill the sandbox?
- 1) 14  
2) 13  
3) 7  
4) 4
- 3 A gardener wants to buy enough mulch to cover a rectangular garden that is 3 feet by 10 feet. One bag contains 2 cubic feet of mulch and costs \$3.66. How much will the minimum number of bags cost to cover the garden with mulch 3 inches deep?
- 1) \$3.66  
2) \$10.98  
3) \$14.64  
4) \$29.28

- 4 A fish tank in the shape of a rectangular prism has dimensions of 14 inches, 16 inches, and 10 inches. The tank contains 1680 cubic inches of water. What percent of the fish tank is empty?
- 1) 10  
2) 25  
3) 50  
4) 75
- 5 The volume of a rectangular prism is 144 cubic inches. The height of the prism is 8 inches. Which measurements, in inches, could be the dimensions of the base?
- 1) 3.3 by 5.5  
2) 2.5 by 7.2  
3) 12 by 8  
4) 9 by 9
- 6 A rectangular prism has a volume of  $3x^2 + 18x + 24$ . Its base has a length of  $x + 2$  and a width of 3. Which expression represents the height of the prism?
- 1)  $x + 4$   
2)  $x + 2$   
3) 3  
4)  $x^2 + 6x + 8$
- 7 A right prism has a square base with an area of 12 square meters. The volume of the prism is 84 cubic meters. Determine and state the height of the prism, in meters.
- 8 The Parkside Packing Company needs a rectangular shipping box. The box must have a length of 11 inches and a width of 8 inches. Find, to the *nearest tenth of an inch*, the minimum height of the box such that the volume is *at least* 800 cubic inches.

- 9 The base of a right pentagonal prism has an area of 20 square inches. If the prism has an altitude of 8 inches, determine and state the volume of the prism, in cubic inches.
- 10 A carpenter made a storage container in the shape of a rectangular prism. It is 5 feet high and has a volume of 720 cubic feet. He wants to make a second container with the same height and volume as the first one, but in the shape of a triangular prism. What will be the number of square feet in the area of the base of the new container?
- 36
  - 72
  - 144
  - 288
- 11 A rectangular prism has a base with a length of 25, a width of 9, and a height of 12. A second prism has a square base with a side of 15. If the volumes of the two prisms are equal, what is the height of the second prism?
- 6
  - 8
  - 12
  - 15
- 12 Two prisms have equal heights and equal volumes. The base of one is a pentagon and the base of the other is a square. If the area of the pentagonal base is 36 square inches, how many inches are in the length of each side of the square base?
- 6
  - 9
  - 24
  - 36

- 13 Tim has a rectangular prism with a length of 10 centimeters, a width of 2 centimeters, and an unknown height. He needs to build another rectangular prism with a length of 5 centimeters and the same height as the original prism. The volume of the two prisms will be the same. Find the width, in centimeters, of the new prism.
- 14 Two prisms with equal altitudes have equal volumes. The base of one prism is a square with a side length of 5 inches. The base of the second prism is a rectangle with a side length of 10 inches. Determine and state, in inches, the measure of the width of the rectangle.
- 15 Ian needs to replace two concrete sections in his sidewalk, as modeled below. Each section is 36 inches by 36 inches and 4 inches deep. He can mix his own concrete for \$3.25 per cubic foot.



How much money will it cost Ian to replace the two concrete sections?

- 16 The volume of a triangular prism is  $70 \text{ in}^3$ . The base of the prism is a right triangle with one leg whose measure is 5 inches. If the height of the prism is 4 inches, determine and state the length, in inches, of the other leg of the triangle.

**G.GMD.A.3: Volume 1****Answer Section**

1 ANS: 3 REF: 081123ge

2 ANS: 1

$$.5 \text{ ft}^3 \times \frac{1728 \text{ in}^3}{1 \text{ ft}^3} = 864 \text{ in}^3 \quad \frac{43 \text{ in} \times 30 \text{ in} \times 9 \text{ in}}{864 \text{ in}^3} \approx 13.4$$

REF: 012419geo

3 ANS: 3

$$3 \times 10 \times \frac{3}{12} = 7.5 \text{ ft}^3 \quad \frac{7.5}{2} = 3.75 \quad 4 \times 3.66 = 14.64$$

REF: 062311geo

4 ANS: 2

$$14 \times 16 \times 10 = 2240 \quad \frac{2240 - 1680}{2240} = 0.25$$

REF: 011604geo

5 ANS: 2 REF: 011215ge

6 ANS: 1

$$\frac{3x^2 + 18x + 24}{3(x+2)}$$

$$\frac{3(x^2 + 6x + 8)}{3(x+2)}$$

$$\frac{3(x+4)(x+2)}{3(x+2)}$$

$$x+4$$

REF: fall0815ge

7 ANS:

$$Bh = V$$

$$12h = 84$$

$$h = 7$$

REF: 011432ge

8 ANS:

$$9.1. (11)(8)h = 800$$

$$h \approx 9.1$$

REF: 061131ge

9 ANS:

$$V = 20 \times 8 = 160$$

REF: 011633ge

10 ANS: 3

$$720 = 5B$$

$$144 = B$$

REF: 081523ge

11 ANS: 3

$$25 \times 9 \times 12 = 15^2 h$$

$$2700 = 15^2 h$$

$$12 = h$$

REF: 061323ge

12 ANS: 1

If two prisms have equal heights and volume, the area of their bases is equal.

REF: 081321ge

13 ANS:

$$4. \quad l_1 w_1 h_1 = l_2 w_2 h_2$$

$$10 \times 2 \times h = 5 \times w_2 \times h$$

$$20 = 5w_2$$

$$w_2 = 4$$

REF: 011030ge

14 ANS:

$$5 \cdot 5 = 10w$$

$$25 = 10w$$

$$2.5 = w$$

REF: 061432ge

15 ANS:

$$2 \left( \frac{36}{12} \times \frac{36}{12} \times \frac{4}{12} \right) \times 3.25 = 19.50$$

REF: 081831geo

16 ANS:

$$\frac{1}{2}(5)(L)(4) = 70$$

$$10L = 70$$

$$L = 7$$

REF: 012330geo