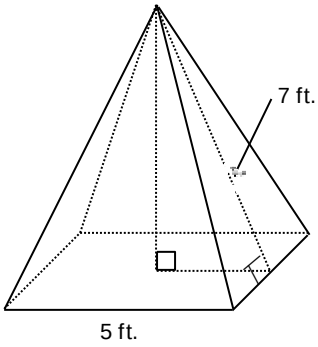
Lesson 5 Volume Questions

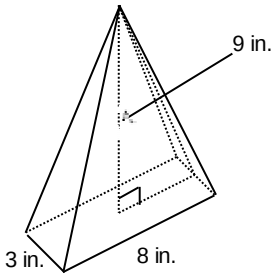
Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Calculate the volume of this right square pyramid to the nearest cubic foot.



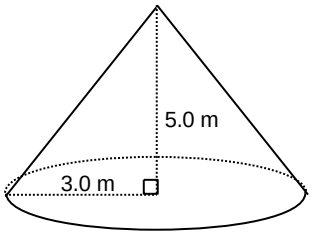
a. 58 cubic feet b. 62 cubic feet c. 54 cubic feet d. 163 cubic feet

____ 2. Calculate the volume of this right rectangular pyramid to the nearest cubic inch.



a. 216 cubic inches b. 72 cubic inches c. 64 cubic inches d. 78 cubic inches

____ 3. Calculate the volume of this right cone to the nearest tenth of a cubic metre.



a. 141.4 m^3 b. 47.1 m^3 c. 49.3 m^3 d. 55.0 m^3

____ 4. A right rectangular prism with base dimensions 7.8 m by 5.1 m has a volume of 110.1 m^3. Determine the height of the prism to the nearest tenth of a metre.
a. 2.8 m b. 8.3 m c. 1.2 m d. 5.5 m

____ 5. A right cone has slant height 15 in. and base diameter 12 in. Determine its volume to the nearest cubic inch.
a. 1555 cubic inches b. 396 cubic inches c. 518 cubic inches d. 543 cubic inches

____ 6. What is the volume of a cube that measures 23" on each side?

a. 12 167 cu in
b. 4232 cu in
c. 529 cu in
d. 2116 cu in

____ 7. Juan fills a 8 L bucket with a container that holds 2 pints. How many times will he have to fill up the container to fill the bucket?

a. 8 times
b. 9 times
c. 17 times
d. 10 times

____ 8. How many pints are in 13.9 quarts?

a. 29.8 pints
b. 7.0 pints
c. 55.6 pints
d. 27.8 pints

____ 9. A garden has an area of 24 yd^2. It is covered in topsoil that is 3 in deep. What is the volume of topsoil used, in yd^3?

a. 72 yd^3
b. 2 yd^3
c. 6 yd^3
d. 24 yd^3

____ 10. Mars approximates a sphere with radius 2100 mi. What is the approximate volume of Mars?
a. 3.1×10^{11} $mi.^3$ b. 3.9×10^{10} $mi.^3$ c. 5.5×10^{7} $mi.^3$ d. 6.8×10^{11} $mi.^3$

____ 11. A flat basketball is inflated using a hand pump. The pump inflates the ball at a rate of 230 cm^3 per pump, to a diameter of 23.5 cm. How many pumps are required to inflate the ball?
a. 27 pumps b. 28 pumps c. 30 pumps d. 29 pumps

____ 12. A china bowl approximates a hemisphere with diameter 27.0 cm. What is the capacity of the bowl to the nearest tenth of a litre? (1000 cm^3 = 1L)
a. 5.2 L b. 10.3 L c. 0.4 L d. 2.6 L

Short Answer

13. In 2008, the Queen Sesheshet Pyramid was discovered in Egypt. Archeologists determined that the original height of this right square pyramid was about 14 m and the original base side length was about 22 m. Determine its original volume to the nearest cubic metre.

14. A right cone has a diameter of 17.1 cm and a height of 11.3 cm. Determine the volume of the cone to the nearest tenth of a cubic centimetre.

15. A fish tank measures 5 ft by 39 in by 27 in. For the best health of the fish, the tank should only be 75% full. What volume of water should the tank hold, in cubic feet?

16. Which is greater in volume, 6 tablespoons or 100 mL?

17. A spherical globe has diameter 41.3 cm. What is the volume of the globe to the nearest tenth of a centimetre?

Problem

18. A right square pyramid has base perimeter 62.4 m and height 6.4 m. Calculate the volume of the pyramid to the nearest cubic metre.

19. The gas tank of Rory's car can hold 55 litres of gas.

    a) Rory is travelling in Colorado, USA, and needs to fill up his tank. The cost of gas is $3.19/gallon. How much will it cost him to fill up, assuming the tank is completely empty?

    b) If Rory took the same car to England, where gas costs $8.06/gal, how much would it cost him to fill up the tank?

20. A garden measuring 7 m by 6 m is to be covered in 15 cm of topsoil. Bags of topsoil cost $7.99 per bag and hold 5 ft^3 of topsoil. How much will the topsoil for this garden cost?

Lesson 5 Volume Questions
Answer Section

MULTIPLE CHOICE

1. ANS: C
2. ANS: B
3. ANS: B
4. ANS: A
5. ANS: C
6. ANS: A
7. ANS: B
8. ANS: D
9. ANS: B
10. ANS: B
11. ANS: C
12. ANS: A

SHORT ANSWER

13. ANS:
    2259 m^3

14. ANS:
    865.0 cm^3

15. ANS:
    Convert the dimensions of the tank to feet.

    Width: 39 in ÷ 12 in/ft = 3.25 ft

    Height: 27 in ÷ 12 in/ft = 2.25 ft

    Calculate the total volume of the tank.
    $V = lwh$

    $V = 5 \times 3.25 \times 2.25$

    $V = 36.5625$ cu ft

    Calculate 75% of the tank's volume.
    $0.75 \times 36.5625 = 27.421875$ cu ft

    The tank should be filled with 27.421875 cu ft of water.

16. ANS:
    Convert tablespoons to mL.
    1 tbsp = 15 mL

$6 \text{ tsp} \times 15 \text{ mL/tbsp} = 90 \text{ mL}$

100 mL is a greater volume than 6 tbsp.

17. ANS:
36 884.9 cm^3

PROBLEM

18. ANS:

The perimeter of the square base is 62.4 m. So, the side length of the base is: $\frac{62.4 \text{ m}}{4} = 15.6 \text{ m}$

Use the formula for the volume of a right rectangular pyramid.

$V = \frac{1}{3}lwh$

$V = \frac{1}{3}(15.6)(15.6)(6.4)$

$V = 519.168$

The volume of the pyramid is approximately 519 m^3.

19. ANS:

a) Convert the tank's capacity to US gallons.

$1 \text{ US gal} \approx 3.8 \text{ L}$

$1 \text{ L} \approx \frac{1}{3.8} \text{ US gal}$

$55 \text{ L} = 55 \times \frac{1}{3.8}$

$55 \text{ L} = 14.5 \text{ US gal}$

The gas tank will hold 14.5 US gallons.

Calculate the cost of filling the tank.

$14.5 \text{ US gal} \times \$3.19/\text{US gal} = \$46.26$

It will cost Rory $46.26 to fill his car's gas tank.

b) Calculate the gas tank's capacity in British gallons.

1 British gal ≈ 4.5 L

$$1 \text{ L} \approx \frac{1}{4.5} \text{ British gal}$$

$$55 \text{ L} \approx 55 \times \frac{1}{4.5}$$

$$55 \text{ L} \approx 12.2 \text{ British gal}$$

The gas tank will hold 12.2 British gallons.

Calculate the cost of filling the tank.
12.2 British gal × \$8.06/US gal = \$98.51

It will cost Rory \$98.51 to fill his car's gas tank in England.

20. ANS:
Convert the dimensions of the garden to feet.
1 m ? 3.2808 ft

Length: 7 m × 3.2808 ft/m ≈ 22.97 ft

Width: 6 m × 3.2808 ft/m ≈ 19.68 ft

Depth: 15 cm × 0.3937 in/cm ÷ 12 in/ft ≈ 0.49 ft

Calculate the volume of topsoil needed.
$V = lwd$

$V = 22.97 \times 19.68 \times 0.49$

$V \approx 222.48$ cu ft

Calculate the number of bags of topsoil needed.
222.48 ÷ 5 ft^3/bag ≈ 45 bags, rounded up

Calculate the cost.
45 bags × \$7.99 = \$359.55

The topsoil for the garden will cost \$359.55.