TEST NAME: **G.9 NEW**
TEST ID: **962978**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **School Assessment**

Student: _____

Class: _____

Date: _____

1. **A cylindrical-shaped container requires 12 cubic feet of soil to be considered full. If a cone with a congruent base and height requires 4 cubic feet of soil, which statement describes how the volumes of these two figures are related?**

   A. The volume of the cone is $\frac{1}{3}$ of the volume of the cylinder.

   B. The volume of the cone is $\frac{1}{4}$ of the volume of the cylinder.

   C. The cylinder's volume is 2 times the volume of the cone.

   D. The cylinder's volume is 8 times the volume of the cone.

2. A cylindrical container has a height of 315 cm and a radius of 65 cm. What is the ***approximate*** volume of the container?

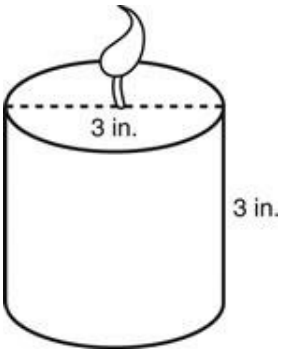
   A. 64,324 cm^3

   B. 128,648 cm^3

   C. 1,045,267 cm^3

   D. 4,181,067 cm^3

3. **A cylindrical candle has a diameter of 3 inches and a height of 3 inches.**



What is the volume, in cubic inches, of the candle?

   A. 27π

   B. 9π

   C. 6.75π

   D. 2.25π

4. A cone-shaped funnel has a diameter of 6 cm and is 10 cm tall. What is the ***approximate*** volume of the funnel?

A. $377\ cm^3$

B. $283\ cm^3$

C. $94\ cm^3$

D. $60\ cm^3$

5. The volume of a cone is 25π cubic inches. If the radius is 5 inches, what is the height of the cone?

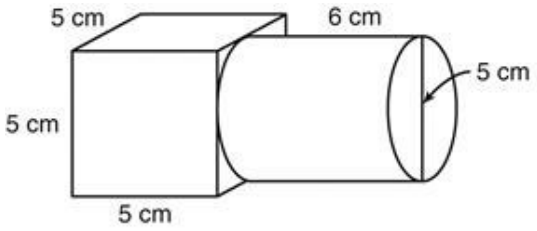
A. $\frac{1}{3}\ in.$

B. 3 in.

C. $7\frac{1}{2}\ in.$

D. 12 in.

6. **Maria built a tool that checks the rate of flow of liquid from one container to another. The tool consists of a cylindrical container attached to a cubic container. The cylinder has a diameter of 5 centimeters and a height of 6 centimeters, and the cube has a side length of 5 centimeters, as shown in the diagram below.**



What is the volume of the two containers that make up Maria's tool?

A. 690.20 cubic centimeters

B. 596.00 cubic centimeters

C. 266.30 cubic centimeters

D. 242.75 cubic centimeters

7. Jim is making frozen juice treats that are in the shape of a cone. The molds he bought are each 3 inches (in.) deep with a diameter of 3 in. What is the approximate volume of juice needed for Jim to make 6 juice treats?

A. $169.6\ in.^3$

B. $127.2\ in.^3$

C. $84.8\ in.^3$

D. $42.4\ in.^3$

8. Mrs. Thomas is preparing lunch for a group of students.

- A can of juice has a radius of 4 cm and height of 11 cm.
- Mrs. Thomas knows she needs at least 5,100 cm^3 of juice.

How many cans of juice will Mrs. Thomas need to buy?

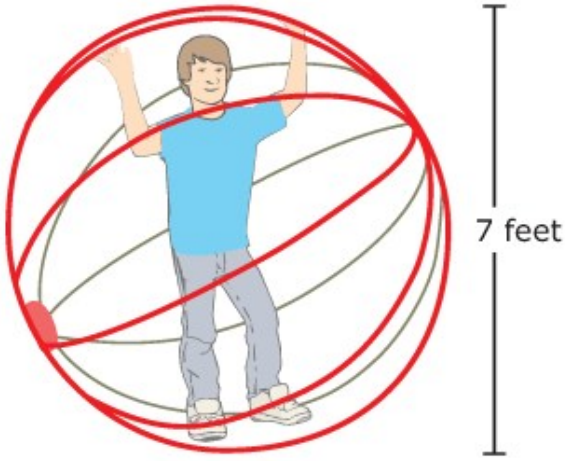
A. 8

B. 9

C. 10

D. 11

9. Albert rented a human sphere to use for entertainment at the school picnic.



Which measure is closest to the volume of the sphere?

A. $44\ ft^3$

B. $51\ ft^3$

C. $88\ ft^3$

D. $180\ ft^3$

10. **Which situation does not require the cube root operation?**

A. determining the side of a cube given the volume

B. determining the radius of a sphere given the volume

C. determining the surface area of a cube given the volume

D. determining the height of a cylinder given the volume and radius

11. The height of a cylindrical jar is twice the radius. When the radius of the jar is represented by x, which algebraic expression would represent the volume?

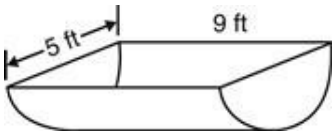
A. $2\pi x^3$

B. $3\pi x^2$

C. $4\pi x^2$

D. $4\pi x^3$

12. **A rancher wants to cut a metal cylinder in half to use as a watering trough as shown below.**



If the cylinder has a diameter of 5 feet and a length of 9 feet, which value is closest to the volume of the trough in cubic feet?

A. 176.6
B. 141.3
C. 88.3
D. 70.7

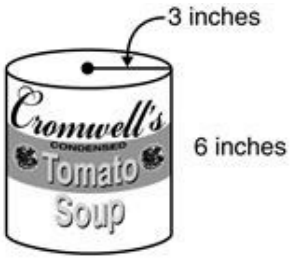
13. A company is going to redesign the cylindrical container it uses to market its product. The volume of the proposed container will be approximately 42.4 cubic inches and the diameter will be 3 inches. What will be the approximate height of the cylinder, rounded to the nearest tenth of an inch?

A. 1.5 inches
B. 4.5 inches
C. 6.0 inches
D. 9.0 inches

14. **Miranda wants to know how much water she could put in a cylinder she has. Which formula should she use to find the volume of her cylinder?**

A. $V = \pi r^2 h$
B. $V = \frac{4}{3}\pi r^3$
C. $V = \frac{1}{3}\pi r^2 h$
D. $V = \frac{1}{3} l\, wh$

15. **The soup can shown below has a radius of 3 inches and a height of 6 inches.**



Note: Figure not drawn to scale

What is the volume of the soup can?

A. 169.56 cubic inches
B. 113.04 cubic inches
C. 56.52 cubic inches
D. 28.26 cubic inches

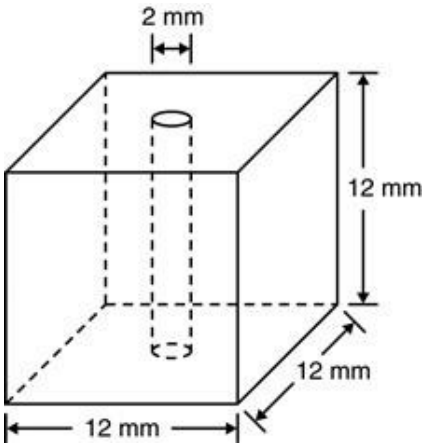
16. For a science project, Angela constructed a cone to use as a mountain. The cone has a diameter of 10 in. and a height of 15 in. What is the ***approximate*** volume of the cone?

A. 150 in.^3
B. 236 in.^3
C. 393 in.^3
D. 471 in.^3

17. Mrs. Davis has a cone-shaped container that holds candy. The cone has a diameter of 6 in. and a height of 8 in. What is the ***approximate*** volume of the container?

A. 25 in.^3
B. 75 in.^3
C. 226 in.^3
D. 301 in.^3

18. **A cylinder 12 millimeters tall was removed from a cube as shown below.**



Which measure is closest to the volume of the remaining cube?

A. 1,577 cubic millimeters
B. 1,690 cubic millimeters
C. 1,766 cubic millimeters
D. 1,879 cubic millimeters

19. What is the ***approximate*** volume of a cylindrical tube that is 7 inches long and has a diameter of 2 inches?

A. 9 in.^3
B. 14 in.^3
C. 22 in.^3
D. 88 in.^3

20. **A large sphere at an amusement park is 165 feet in diameter. Which of the following is closest to the volume, in cubic feet, of the sphere?**

A. 261,000
B. 2,351,000
C. 18,810,000
D. 41,210,000

21. **Cylindrical tank A has $\frac{9}{10}$ of the radius and $\frac{9}{10}$ of the height of cylindrical tank B. If tank A can hold 20 gallons, approximately how many gallons can tank B hold?**

A. 22.22
B. 24.69
C. 26.62
D. 27.43

22. John and Alex got gumballs from a machine.

- John's gumball has a diameter of 1.5 cm
- Alex's gumball has a radius of 1 cm

Which statement is true?

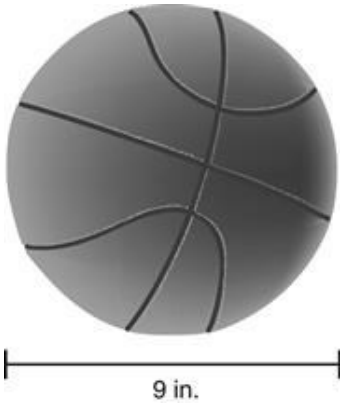
A. Alex's gumball is about 4.2 cm^3 larger than John's gumball.

B. Alex's gumball is about 2.4 cm^3 larger than John's gumball.

C. John's gumball is about 4.2 cm^3 larger than Alex's gumball.

D. John's gumball is about 2.4 cm^3 larger than Alex's gumball.

23. **What is the volume, in cubic inches, of a basketball with a diameter of 9 inches?**



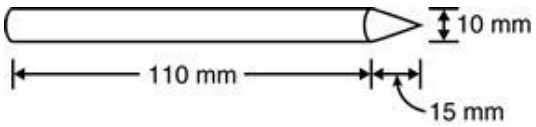
A. 68.34π

B. 121.5π

C. 324π

D. 972π

24. **The marker shown below was made using a cylinder and a cone. The cylinder and cone share the same base. The dimensions of the marker are given in millimeters.**



Which is closest to the volume of the marker?

A. 3,271 cubic millimeters

B. 3,611 cubic millimeters

C. 9,028 cubic millimeters

D. 9, 813 cubic millimeters

25. **Harold measured the dimensions of a cylindrical soda can. The height of the can was 5 inches and the diameter of the top and the bottom was 3 inches. Based on these measurements, what is the volume of the can in cubic inches?**

A. 11.25π cubic inches
B. 15π cubic inches
C. 18.75π cubic inches
D. 45π cubic inches

26. Tonya has a wastebasket shaped as a cylinder. The wastebasket measures 20 inches tall and has a radius of 5 inches.

- Devon threw a cylinder-shaped snack container into the wastebasket.
- The snack container has a radius of 4 inches and a height of 6 inches.

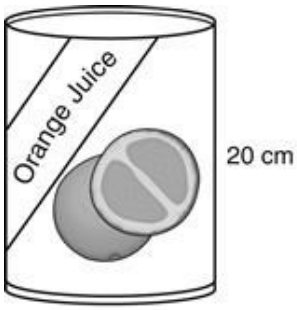
What is the ***approximate*** amount of space left with the snack container inside the wastebasket?

A. 5,077 cubic inches
B. 1,269 cubic inches
C. 318 cubic inches
D. 239 cubic inches

27. **A thermos in the shape of a cylinder will be filled with hot chocolate. If the thermos has a radius of 4 inches and is 12 inches tall, which formula could be used to find the number of cubic inches of hot chocolate needed to completely fill this thermos?**

A. $V = 3.14 \times 16 \times 12$
B. $V = 3.14 \times 8 \times 12$
C. $V = 3.14 \times 4 \times 12$
D. $V = 3.14 \times 4 \times 144$

28. **A can of orange juice has a circular base with an area of 156 square centimeters. The height of the can is 20 centimeters.**



What is the volume of the can of orange juice in cubic centimeters?

A. 176
B. 800
C. 3120
D. 62 400

29. A container shaped like a sphere has a radius of $1\frac{1}{3}$ yards. It will be filled with gas that costs $12 per cubic yard. ***About*** how much will it cost to fill the container with gas?

A. $62

B. $67

C. $90

D. $120

30. A cone-shaped container is filled with water. The container has a height of 18 inches and a diameter of 9 inches. ***Approximately*** how much water is in the container?

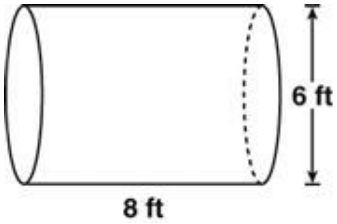
A. 1,526 $in.^3$

B. 382 $in.^3$

C. 162 $in.^3$

D. 85 $in.^3$

31. **What is the volume, in cubic feet, of the cylinder below?**



A. 24π

B. 48π

C. 72π

D. 288π

32. **Joe has a cylindrical glass jar that he wants to fill completely with apple juice. The jar has a diameter of 4 inches and a height of 8 inches. Which formula can Joe use to determine the amount of apple juice in this glass jar?**

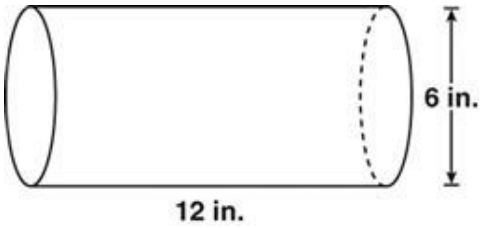
A. $V = 3\pi r^2 h$

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

C. $V = \pi r^2$

D. $V = \frac{1}{3}\pi r^2 h$

33. **What is the volume, in cubic inches, of the cylinder below?**



A. 36π
B. 72π
C. 108π
D. 432π

34. **A hollow glass cone is filled with perfume and placed inside of a hollow cylindrical container with the same height and diameter as the cone. The cylinder will then be filled with packing material. If the cone occupies 60 cm^3 of space, how many cubic centimeters of packing material will be needed?**

A. 30
B. 60
C. 120
D. 180

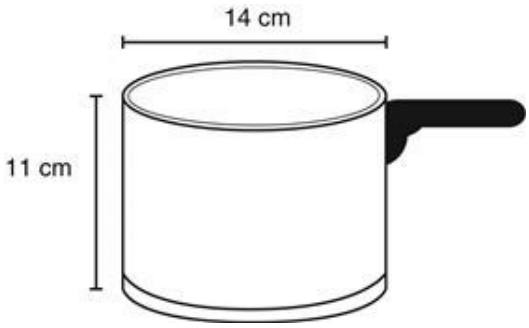
35. **The volume of a cylindrical container is 1 gallon. If the dimensions are dilated by a scale factor of $\frac{3}{4}$, what is the volume of the new container?**

A. $\frac{3}{4}$gal
B. $\frac{27}{64}$gal
C. $\frac{9}{16}$gal
D. $\frac{9}{64}$gal

36. A cylinder-shaped container is used to store water. The container has a height of 6 feet and a diameter of 3 feet. ***About*** how much water is in the container when it is $\frac{3}{4}$ full?

A. 127 cubic feet
B. 42 cubic feet
C. 32 cubic feet
D. 14 cubic feet

37. **Mrs. Mendez is going to dip pretzels into a pot of chocolate. The dimensions of the pot are in centimeters as shown.**



Which measure is closest to the volume of the pot?

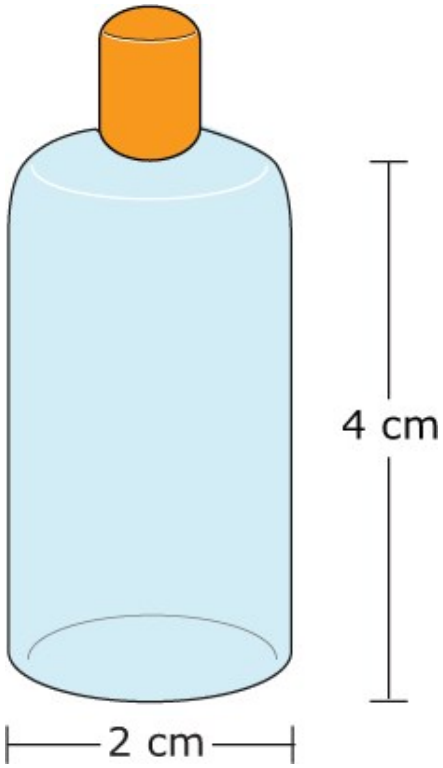
A. $77\ cm^3$

B. $154\ cm^3$

C. $539\ cm^3$

D. $1694\ cm^3$

38. A bottle has the dimensions shown below, in centimeters (cm). The bottle is in the shape of a cylinder.



What is the volume of the bottle, in cubic centimeters?

A. 4π

B. 8π

C. 12π

D. 16π

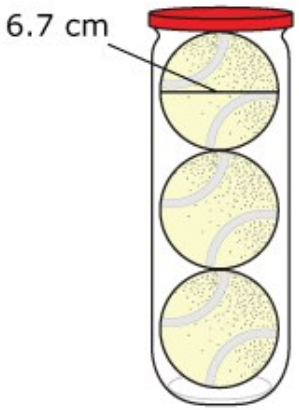
39. A cylinder has a height of 7 in. and a diameter of 6 in. What is the ***approximate*** volume of the cylinder?

A. 132 in.^3

B. 198 in.^3

C. 792 in.^3

40. Tennis balls are packaged three per container. The diameter of a tennis ball is approximately 6.7 cm.



Which equation represents the total volume of the tennis balls in the container?

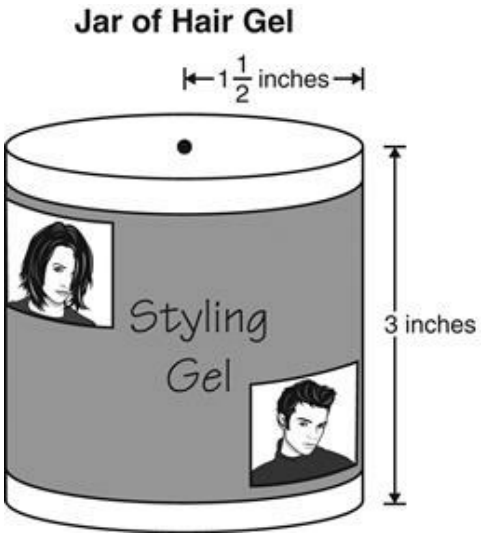
A. $V = \frac{4}{3} \cdot \pi \cdot 3.35^3$

B. $V = 4 \cdot \pi \cdot 3.35^3$

C. $V = \left(\frac{4}{3} \cdot \pi \cdot 3.35^3 \right)^3$

D. $V = (4 \cdot \pi \cdot 3.35)^3$

41. **This cylindrical jar of hair gel has a radius of $1\frac{1}{2}$ inches and a height of 3 inches.**



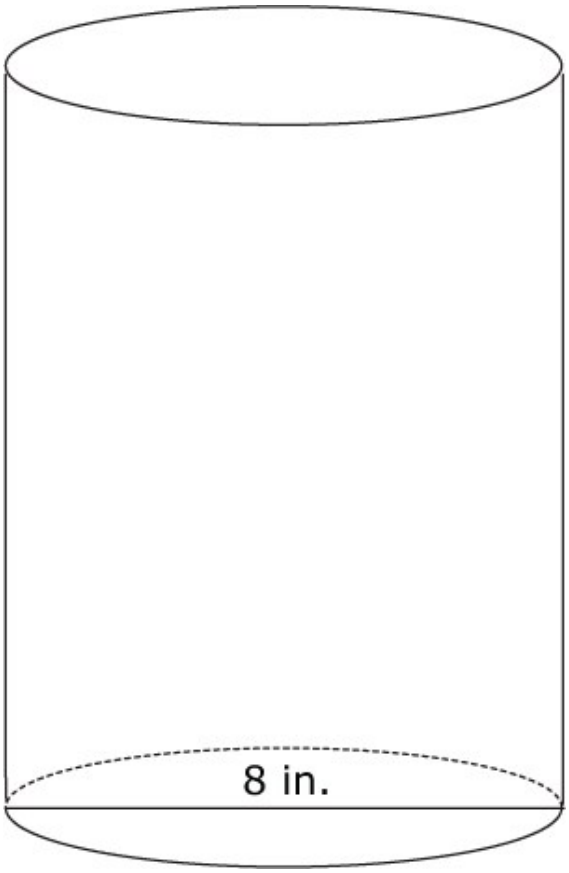
What is the approximate volume of this container?

A. 5.30 cubic inches
B. 21.20 cubic inches
C. 28.26 cubic inches
D. 42.39 cubic inches

42. There are 12 cylindrical cans in a package. Each can has a height of 4.9 in. and a diameter of 2.5 in. What is the ***approximate*** total volume of the 12 cans?

A. 77 in.^3
B. 147 in.^3
C. 289 in.^3
D. 577 in.^3

43. The diameter of the base of a cylindrical cookie jar is 8 inches (in.). The volume of the cookie jar is 160π cubic inches. What is the height of the cookie jar?



A. 20 in.

B. 10 in.

C. 8 in.

D. 2.5 in.

44. **Javier has a model of a cone with a radius of 3 inches and a height of 10 inches. Javier increased his model's volume by doubling its radius and height. What is the volume of the larger cone in cubic inches?**

A. 30π

B. 60π

C. 120π

D. 240π

45. A company makes a cone-shaped container with a height of 15 in. The area of its base is about 78.8 in.^{2} ***Approximately*** what is the volume of the container?

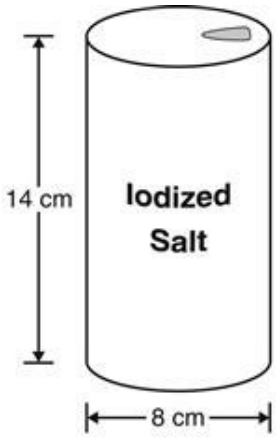
A. 3,546 in.^{3}

B. 1,182 in.^{3}

C. 394 in.^{3}

D. 94 in.^{3}

46. **The cylindrical container of salt below has a diameter of 8 centimeters and a height of 14 centimeters.**



Which measurement is closest to the volume of the container?

A. 352 cubic centimeters

B. 703 cubic centimeters

C. 1,105 cubic centimeters

D. 2,813 cubic centimeters

47. A family must buy water to fill their swimming pool. The pool is shaped like a cylinder with a diameter of 7 meters and a height of 1.5 meters. The water delivery company charges $1.10 for each cubic meter of water. ***About*** how much will the family have to pay for the water?

A. $58

B. $64

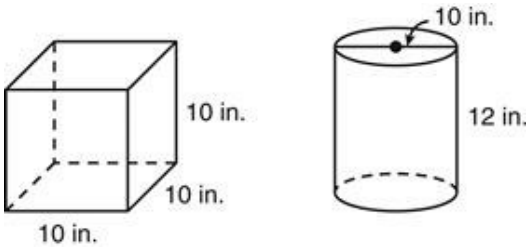
C. $230

D. $254

48. **It takes 6 cubic inches of colored sand to fill a plastic cone. How many cubic inches will it take to fill a plastic cylinder with the same base and height as the cone?**

A. 2
B. 12
C. 18
D. 24

49. **A cylinder with a diameter of 10 inches (in.) and a cube are shown.**



Which statement about the volume of the two shapes is correct?

A. Both figures have the same volume.
B. The volume of the cube is greater than the volume of the cylinder.
C. The volume of the cylinder is greater than the volume of the cube.
D. There is not enough information to determine the volume of these containers.

50. **The volume of a sphere is given by the formula** $v = \frac{4}{3}\pi r^3$**, where *v* is the volume and *r* is the radius. Which function would not be used to find the measurement of the radius when given the volume of a sphere?**

A. multiplication
B. division
C. cube root
D. square root

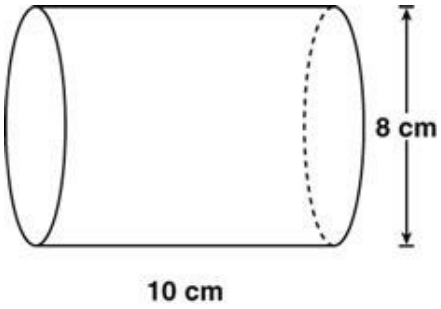
51. Wang has two cylindrical cans. Each can is 10 inches tall. The diameter of the first can is half that of the second can. If water were poured into each can, how much more water could the second can hold than the first?

A. four times as much
B. two times as much
C. half as much
D. one-fourth as much

52. **A cylinder has a volume of 18*n* cubic inches. If the radius is 3 inches, what is the height of the cylinder in inches?**

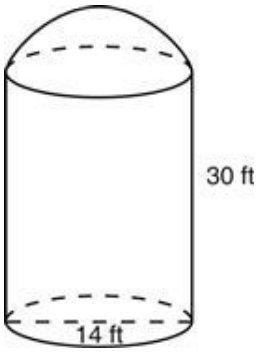
A. 15
B. 9
C. 6
D. 2

53. **What is the volume, in cubic centimeters, of the cylinder below?**



A. 40π
B. 80π
C. 160π
D. 640π

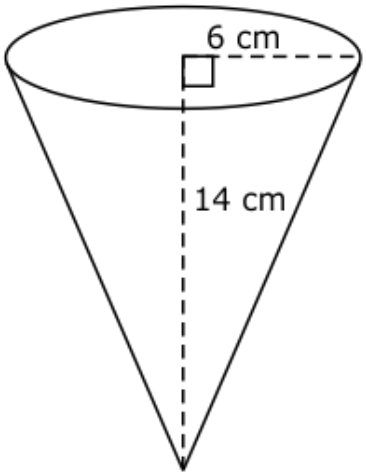
54. **A grain silo with the shape of a right cylinder is to be filled with corn. The diameter of the storage unit is 14 feet and the height is 30 feet.**



Excluding the domed top, approximately how many cubic feet of corn will the grain storage unit hold? (Use $\pi \approx 3.14$)

A. 1318.8
B. 1472.7
C. 4615.8
D. 18,463.2

55. What is the ***approximate*** volume of the cone below?



A. 263 cm^3

B. 528 cm^3

C. 1,583 cm^3

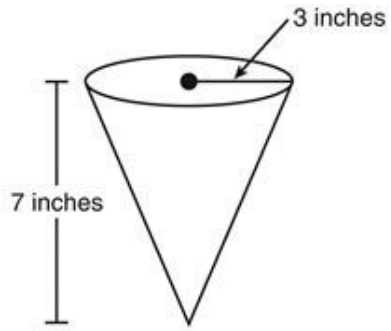
56. What is the ***approximate*** volume of a sphere with a diameter 24 cm?

A. 57,900 cm^3

B. 7,240 cm^3

C. 2,410 cm^3

57. **Mike has a large plastic cup that he is going to fill with water. The plastic cup is in the shape of a cone as shown below.**



Which is closest to the volume of Mike's cup?

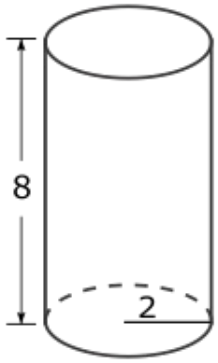
A. 21 cubic inches

B. 63 cubic inches

C. 66 cubic inches

D. 198 cubic inches

58. The cylinder shown below has a radius of 2 units and a height of 8 units.



Which cylinder has the same volume as the cylinder above?

A. cylinder with a radius of 8 units and a height of 2 units

B. cylinder with a radius of 4 units and a height of 6 units

C. cylinder with a radius of 4 units and a height of 4 units

D. cylinder with a radius of 4 units and a height of 2 units

59. **A scoop of ice cream in the shape of a sphere with a radius of $1\frac{1}{4}$ inches is placed in a cone. The base of the cone has a diameter of $2\frac{1}{2}$ inches and the height of the cone is 3 inches. If the ice cream is left to melt, will the cone hold all of the ice cream?**

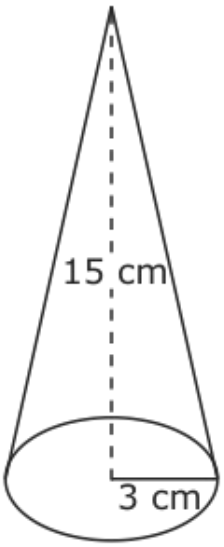
A. Yes, because the volume of the cone is greater than the volume of the sphere.

B. Yes, because the volume of the sphere is greater than the volume of the cone.

C. No, because the volume of the cone is greater than the volume of the sphere.

D. No, because the volume of the sphere is greater than the volume of the cone.

60. What is the ***approximate*** volume of the cone below?



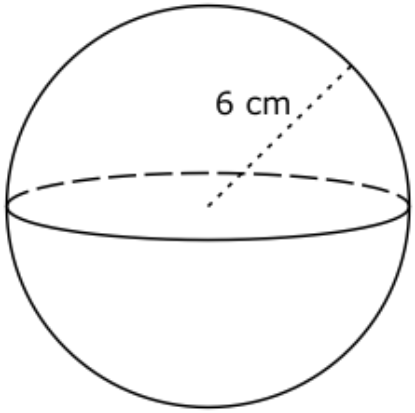
A. $45\ cm^3$

B. $94\ cm^3$

C. $141\ cm^3$

D. $212\ cm^3$

61. A sphere is shown below.



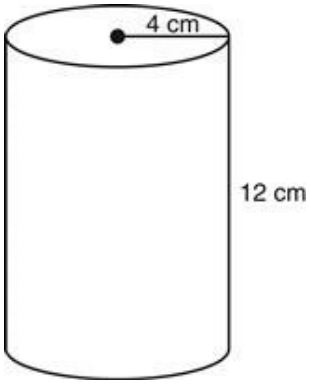
What is the ***approximate***volume of the sphere?

A. $905\ cm^3$

B. $679\ cm^3$

C. $151\ cm^3$

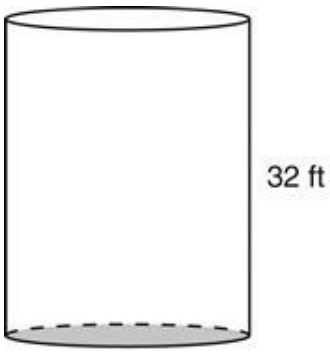
62. **Jennifer is using a cylinder like the one shown below for a science experiment.**



What is the volume, in cubic centimeters, of the cylinder?

A. 50.24
B. 150.72
C. 301.44
D. 602.88

63. **A cylindrical tank has a circular base with an area of 480 square feet. The height of the tank is 32 feet.**



How many cubic feet of water will the tank hold when it is completely full?

A. 512
B. 15,360
C. 32,768
D. 491,520

64. Joe went to the county fair. He noticed a display of the prizes that he could win. One of the prizes had a volume of approximately 114 cubic inches. What could the shape of the prize be?

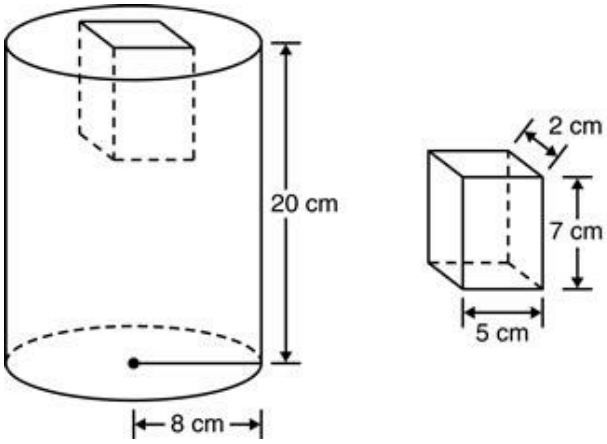
A. a circle with a radius of 6 inches

B. a sphere with a diameter of 6 inches

C. a cone with a diameter of 6 inches and a height of 3 inches

D. a cylinder with a radius of 4 inches and a height of 9 inches

65. **A right rectangular prism was removed from the center of a solid cylinder as shown below. The dimensions are given in centimeters.**



Which is closest to volume of the remaining cylinder?

A. 3,901 cubic centimeters
B. 3,949 cubic centimeters
C. 4,019 cubic centimeters
D. 4,089 cubic centimeters

66. Tina made a model of the moon for her science class. She used a sphere with a radius of 7 cm. What was the ***approximate*** volume of the sphere?

A. 1,620 cm^3
B. 1,437 cm^3
C. 205 cm^3
D. 180 cm^3

67. An ice cream cone is 11.5 cm high and has a diameter of 5 cm. What is the ***approximate*** volume of the ice cream cone?

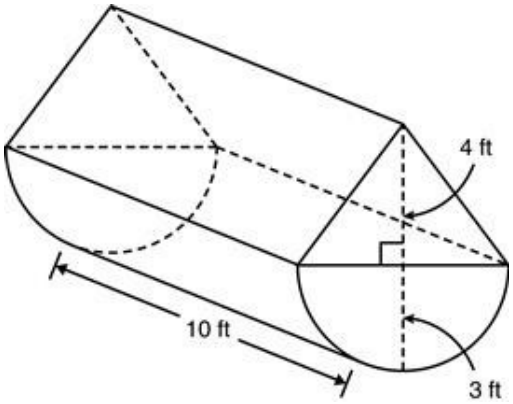
A. $60\ cm^3$

B. $75\ cm^3$

C. $120\ cm^3$

D. $301\ cm^3$

68. **The figure below is made with half of a cylinder topped with a right triangular prism.**



Which measure is closest to the volume of the figure?

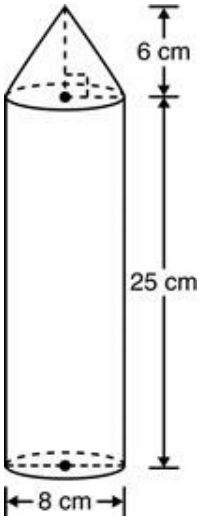
A. $261\ ft^3$

B. $381\ ft^3$

C. $403\ ft^3$

D. $685\ ft^3$

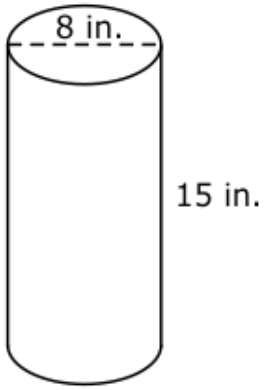
69. **The solid below was built using a right cylinder and a cone. The dimensions of the solid are given in centimeters (cm).**



Which measurement is closest to the total volume of the solid?

A. 519 cubic centimeters
B. 678 cubic centimeters
C. 1357 cubic centimeters
D. 1557 cubic centimeters

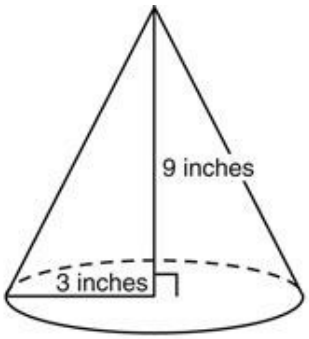
70. A cylinder is shown below.



What is the ***approximate*** volume of the cylinder?

A. 120 in.^3
B. 377 in.^3
C. 754 in.^3

71. **What is the volume, in cubic inches, of the cone below?**



Note: The figure is not drawn to scale.

A. 18π
B. 27π
C. 81π
D. 108π

72. Mrs. Glickman is making a two-layer cake. Each layer is shaped like a cylinder.

- The bottom layer of the cake has a diameter of 12 in. and a height of 5 in.
- The top layer of the cake has a diameter of 8 in. and a height of 3 in.

What is the ***approximate*** volume of the cake?

A. 132 $in.^3$
B. 264 $in.^3$
C. 716 $in.^3$
D. 2,864 $in.^3$

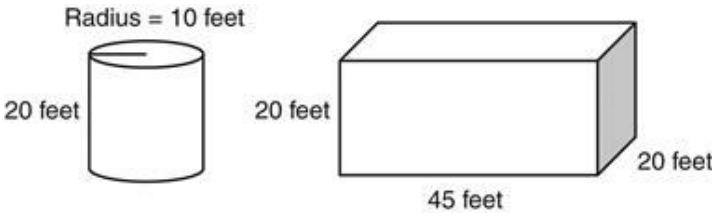
73. Ashley and Tom each have a ball.

- Ashley's ball has a radius of 3 inches.
- Tom's ball has a radius of 4 inches.

What is the ***approximate*** difference between the volumes of the two balls?

A. 113 $in.^3$
B. 155 $in.^3$
C. 268 $in.^3$
D. 381 $in.^3$

74. **The dimensions of grain storage bins in the shape of a cylinder and a rectangular prism are shown below.**



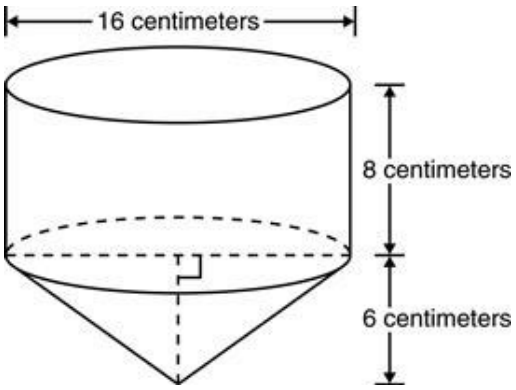
Which measurement is closest to the difference between the volumes of the 2 bins?

A. 24,280 cubic feet
B. 17,500 cubic feet
C. 11,720 cubic feet
D. 4,480 cubic feet

75. **A right circular cone has a volume of 64 cubic feet. A new right circular cone is created by reducing the radius and height of the original cone by a scale factor of $\frac{1}{2}$. Which statement describes the volume of the new cone?**

A. The volume of the new cone is $\frac{1}{2}$ the volume of the original cone.
B. The volume of the new cone is $\frac{1}{8}$ the volume of the original cone.
C. The volume of the new cone is $\frac{1}{4}$ the volume of the original cone.
D. The volume of the new cone is $\frac{1}{16}$ the volume of the original cone.

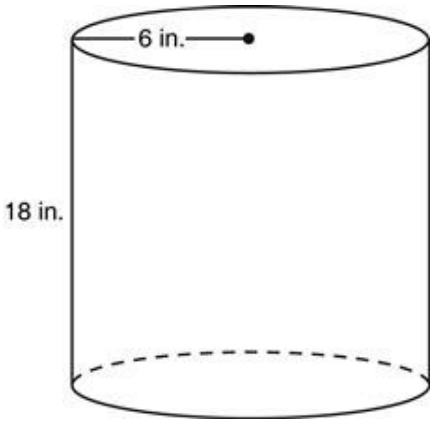
76. **The solid below was built using a cylinder and a cone. The cylinder and cone have the same radius.**



Which measure is closest to the volume, in cubic centimeters, of the solid?

A. $402\ cm^3$
B. $502\ cm^3$
C. $1,608\ cm^3$
D. $2,010\ cm^3$

77. **Which expression represents the volume of the cylinder in cubic inches?**



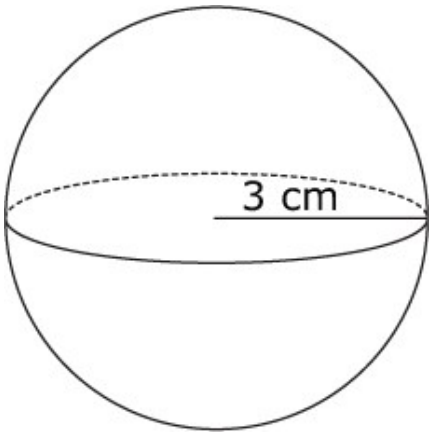
A. $6 \times 18 \times \pi$

B. $\pi \times 6^2 \times 18$

C. $6 \times 18^2 \times \pi$

D. $2\pi \times 6 \times 18$

78. What is the volume of a sphere with a radius of 3 centimeters (cm)?



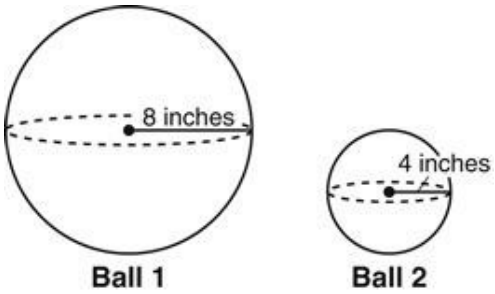
A. 4π cubic cm

B. 12π cubic cm

C. 27π cubic cm

D. 36π cubic cm

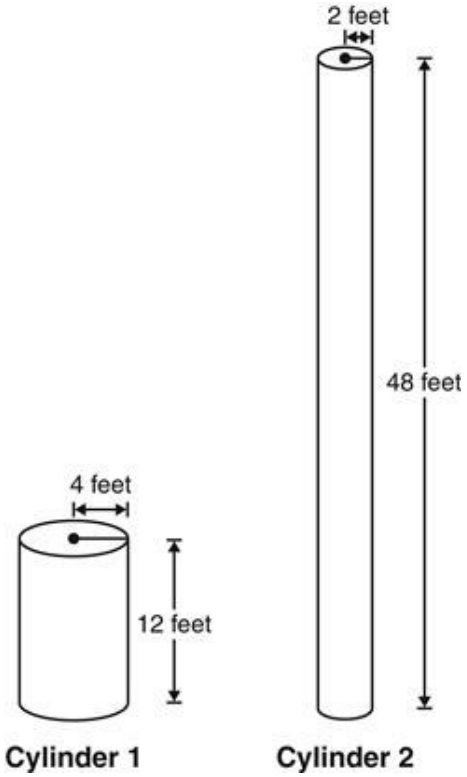
79. **Kayla has two spherical balls in her yard. They are shown below.**



Which statement about their volumes or surface areas is true?

A. The volume of Ball 2 is twice the volume of Ball 1.
B. The volume of Ball 1 is 8 times the volume of Ball 2.
C. The surface area of Ball 2 is 8 times the surface area of Ball 1.
D. The surface area of Ball 1 is twice the surface area of Ball 2.

80. **Two cylinders are shown below.**



Which statement is true about the cylinders?

A. The surface areas of both cylinders are the same, but the volumes are different.
B. The volumes of both cylinders are the same, but the surface areas are different.
C. The surface areas and volumes of both cylinders are different.
D. The surface areas and volumes of both cylinders are the same.

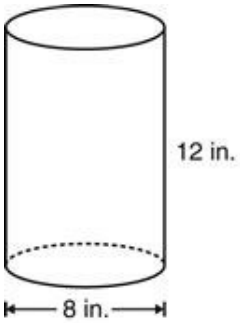
81. **A soccer ball has a radius of 11 cm. Using $\pi \approx 3.14$, what is the approximate volume of the soccer ball in cubic centimeters?**

A. 1520
B. 3135
C. 4772
D. 5572

82. **A right circular cylinder has a volume of 10 cubic centimeters. A new right circular cylinder is created by increasing both the radius and the height of the original cylinder by a factor of 4. What is the volume of the new cylinder?**

A. 40 cubic centimeters
B. 80 cubic centimeters
C. 160 cubic centimeters
D. 640 cubic centimeters

83. **Which calculation shows the volume, in cubic inches, of the cylinder below?**



A. $V = (8)(\pi)(12)$
B. $V = \left(8^2\right)(\pi)(12)$
C. $V = (4)(\pi)(12)$
D. $V = \left(4^2\right)(\pi)(12)$

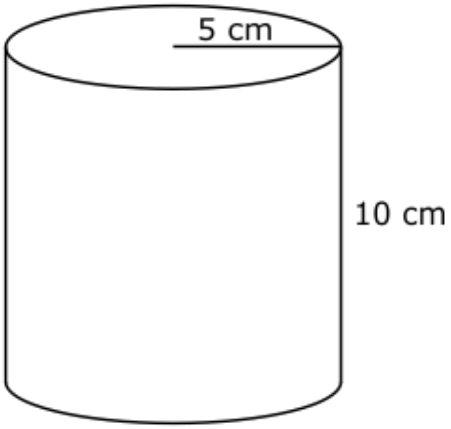
84. When filled, a particular round balloon has a diameter of 14 inches (in.). What is the approximate volume of air needed to fill this balloon?

A. 1,078 $in.^3$
B. 1,437 $in.^3$
C. 8,621 $in.^3$
D. 11,494 $in.^3$

85. **A cone has a volume of 60π cubic feet. If the radius is 2 feet, what is the height of the cone?**

A. 10 feet
B. 15 feet
C. 45 feet
D. 90 feet

86. What is the ***approximate*** volume of the cylinder below?



A. 785 cm^3
B. 314 cm^3
C. 157 cm^3

87. Mia dropped a steel ball in a conical tank that was filled to the top with water. The tank had a diameter of 12 centimeters (cm) and a height of 12 cm. What was the radius of the ball if the amount of the water that spilled out of the tank was 3 times less than the amount of the water left in the tank?

A. 3.00 cm
B. 3.30 cm
C. 4.76 cm
D. 5.24 cm

88. **A table tennis ball has a diameter of 40 mm. What is the volume of the table tennis ball in cubic millimeters?**

A. $\frac{1600\pi}{3}$

B. 6000π

C. $\frac{32,000}{3}\pi$

D. $\frac{256,000}{3}\pi$

89. A cone has a height of 30 in. and a diameter of 20 in. What is the ***approximate*** volume of the cone?

A. 600 $in.^3$

B. 1,885 $in.^3$

C. 3,140 $in.^3$

90. In his garden, Jim is using cone-shaped planters for his hanging plants. Each planter has a diameter of 8 inches and a height of 13 inches. He has 6 planters, and wants to fill each planter $\frac{3}{4}$ of the way with soil.

What is the total volume of soil Jim will need for his hanging plants?

A. 163 $in.^3$

B. 218 $in.^3$

C. 871 $in.^3$

D. 980 $in.^3$

91. A spherical ball of solid chocolate has a diameter of 1.6 inches. What is the ***approximate*** volume of the chocolate?

A. 2.1 $in.^3$

B. 2.7 $in.^3$

C. 10.7 $in.^3$

D. 17.2 $in.^3$

92. A company sells snack mix in a cylindrical can. The can has a 5-inch diameter and holds approximately $157\ in^3$ of snack mix when it is completely full. How tall, to the nearest inch, is the can?

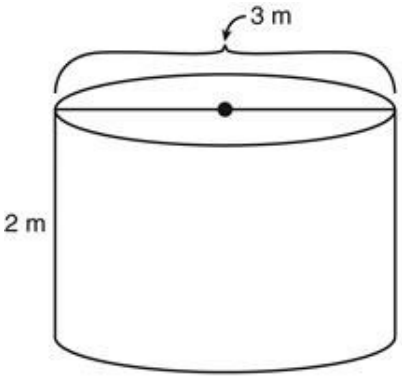
A. 2 inches

B. 8 inches

C. 10 inches

D. 20 inches

93. **Frank has a cylindrical water storage tank on his ranch. The tank has a diameter of 3 meters (m) and a height of 2 meters, as shown below.**



Note: Art not to scale.

What is the volume of the tank?

A. 9.42 cubic meters

B. 14.13 cubic meters

C. 18.84 cubic meters

D. 56.52 cubic meters

94. **Which 3-dimensional figure is associated with the volume formula,** $V = \frac{4}{3}\pi r^3$?

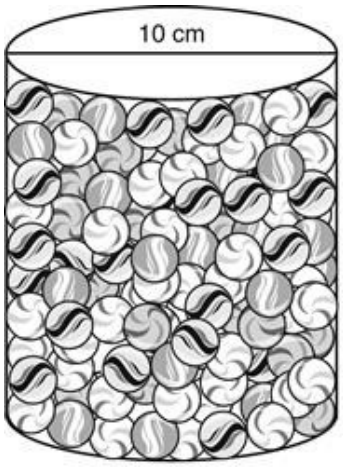
A. pyramid

B. sphere

C. prism

D. cone

95. **Monica has a cylindrical container full of marbles. The container is shown below.**



The height of the container is approximately 12 centimeters. Which is closest to the volume of Monica's container, in cubic centimeters?

A. 188
B. 377
C. 942
D. 3,768

96. **Which 3-dimensional figure is associated with the volume formula,** $V = \frac{1}{3}\pi r^2 h$?

A. pyramid
B. cylinder
C. sphere
D. cone

97. Joel drew two cones on a piece of paper.

- The larger cone has a diameter of 8 inches and a height of 12 inches.
- The smaller cone has a radius and height equal to $\frac{1}{4}$ the size of the larger cone.

What is the ***approximate*** volume of the smaller cone?

A. 3 in.^3
B. 13 in.^3
C. 50 in.^3
D. 201 in.^3

98. **Russell is filling a cylinder-shaped swimming pool that has a diameter of 20 feet. He fills it with water to a depth of 3 feet. What is the volume of the water in the pool, to the nearest cubic foot?**

A. 377 cubic feet
B. 942 cubic feet
C. 2958 cubic feet
D. 3768 cubic feet

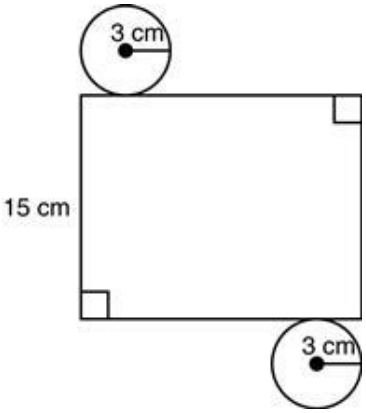
99. **A right cylinder-shaped water tank is used to supply water to a reservoir. If the cylinder has a diameter of 16 feet and a height of 22 feet, what is a reasonable estimate of the maximum amount of water the tank can hold?** (Use $\pi \approx 3.14$)

A. 1100 cubic feet
B. 2700 cubic feet
C. 3800 cubic feet
D. 4400 cubic feet

100. An ice cream cone has a radius of 2 inches and a height of 6 inches. How much ice cream can fit inside the cone?

A. 4 in.^3
B. 6 in.^3
C. 25 in.^3
D. 101 in.^3

101. **Which measurement is closest to the volume of the three-dimensional figure represented by this net? (Use $\pi \approx 3.14$)**



A. 135 cubic centimeters
B. 141 cubic centimeters
C. 339 cubic centimeters
D. 424 cubic centimeters

102. A sports equipment company designed a ball with a diameter of 5 inches. Which expression could be used to find the volume of the ball?

A. $4\pi(5^2)$
B. $4\pi(2.5^2)$
C. $\frac{4}{3}\pi(5^3)$
D. $\frac{4}{3}\pi(2.5^3)$

103. What is the ***approximate*** volume of a spherical ball with a diameter of 16 inches?

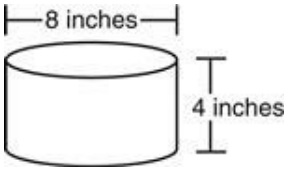
A. 100 in.^3

B. 268 in.^3

C. $1{,}070 \text{ in.}^3$

D. $2{,}145 \text{ in.}^3$

104. **A company makes the cylindrical container shown below.**



The company will make a new container by increasing the height of the original one by 2 inches. How will the volume of the new container compare to the volume of the original container?

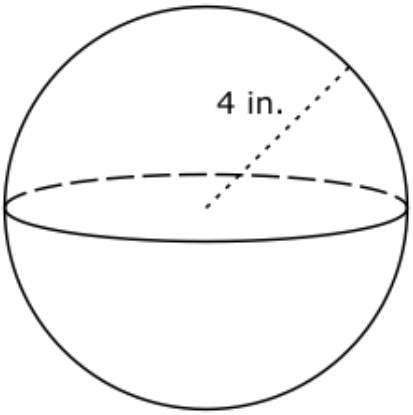
A. The new container will have half the volume of the original.

B. The new container will have twice the volume of the original.

C. The new container will have $\frac{2}{3}$ the volume of the original.

D. The new container will have $1\frac{1}{2}$ times the volume of the original.

105. What is the ***approximate*** volume of the sphere below?



A. 67 in.^3

B. 268 in.^3

C. 402 in.^3

106. Trey purchased a new salt container that is shaped like a cylinder.

- The new container is 4 in. tall with a radius of 2.5 in.
- His old cylinder-shaped salt container was 5 in. tall with a radius of 2 in.

Which statement is true?

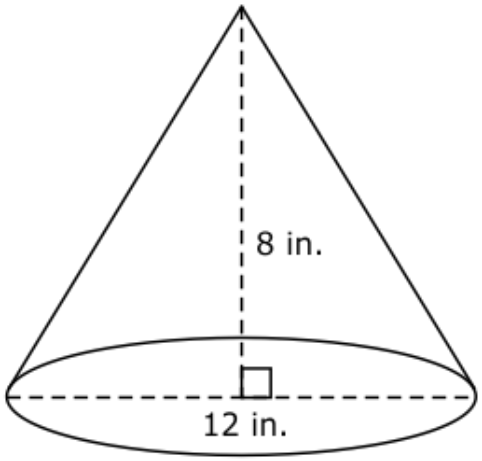
A. The volume of the new container is greater by about 1 $in.^3$

B. The volume of the new container is greater by about 10 $in.^3$

C. The volume of the new container is greater by about 16 $in.^3$

D. The volume of the new container is the same as the old container.

107. The cone below has a diameter of 12 in.



What is the ***approximate*** volume of the cone?

A. 302 $in.^3$

B. 904 $in.^3$

C. 1,206 $in.^3$

108. A soup bowl is in the shape of a hemisphere with a diameter of 10 cm. What is the approximate maximum volume of soup that the bowl can hold?

A. $2{,}094\ cm^3$

B. $524\ cm^3$

C. $262\ cm^3$

D. $196\ cm^3$

109. **A can of paint in the shape of a cylinder has a radius of 4 inches and a height of 9 inches. Which formula is needed to find the volume of the can?**

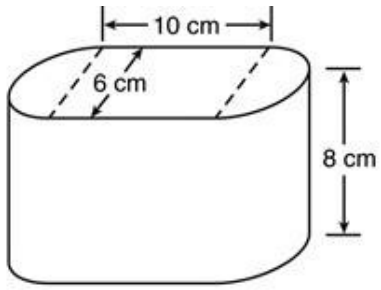
A. $\pi(4^2)$

B. $\pi(4^2)(9)$

C. $\pi(8^2)(9)$

D. $2\pi(4^2) + 2\pi(4)(9)$

110. **The figure shown below is composed of a rectangular prism and two half cylinders.**



Note: The figure is not drawn to scale.
Which is closest to the volume of the figure?

A. $781\ cm^3$

B. $706\ cm^3$

C. $631\ cm^3$

D. $593\ cm^3$

111. What is the ***approximate*** volume of a spherical ball with a diameter of 6.7 cm?

A. 141 cm^3

B. 156 cm^3

C. 564 cm^3

D. 1,260 cm^3

112. The diameter of a ping-pong ball is 4 cm. What is the ***approximate*** volume of the ball?

A. 268 cm^3

B. 67 cm^3

C. 34 cm^3

113. To build a snowman, Victor made three snowballs with diameters of 1 meter (m), 1.5 m, and 2m. To the nearest cubic meter, what is the total volume of snow used in the snowman?

A. 4

B. 6

C. 23

D. 52

114. Jack is making 4 cylindrical wax candles. If he plans to make candles with a diameter of 7 cm and a height of 12 cm, approximately how many cubic centimeters of wax will Jack need to make the candles?

A. 7,389

B. 6,333

C. 3,167

D. 1,847

115. A spherical container has a diameter of 6 inches. Gretchen put sand in the container until it was half full. ***About*** how much sand did Gretchen put in the container?

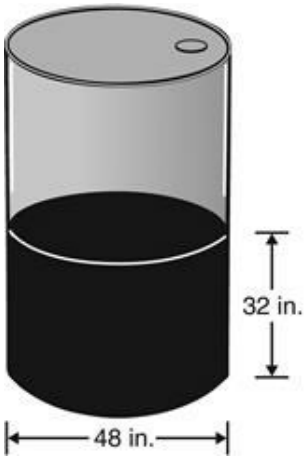
A. 57 in.^3

B. 113 in.^3

C. 452 in.^3

D. 904 in.^3

116. **A cylindrical oil can at a repair shop is partially filled with recycled oil. The can is filled to the level shown in the picture below.**



What is the volume of the portion of the can that is filled with oil?

A. $768\pi \text{ in.}^3$

B. $1,536\pi \text{ in.}^3$

C. $9,216\pi \text{ in.}^3$

D. $18,432\pi \text{ in.}^3$

117. Tom is filling a spherical beach ball with air for the pool party. The ball has a radius of 8 inches. What is the ***approximate*** amount of air the ball will hold?

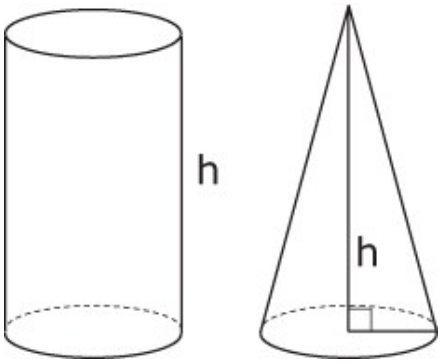
A. 33 in.^3

B. 267 in.^3

C. $1{,}608 \text{ in.}^3$

D. $2{,}144 \text{ in.}^3$

118. A cylinder and a cone have congruent bases and the same volume. What could be the height of the cylinder and the height of the cone?



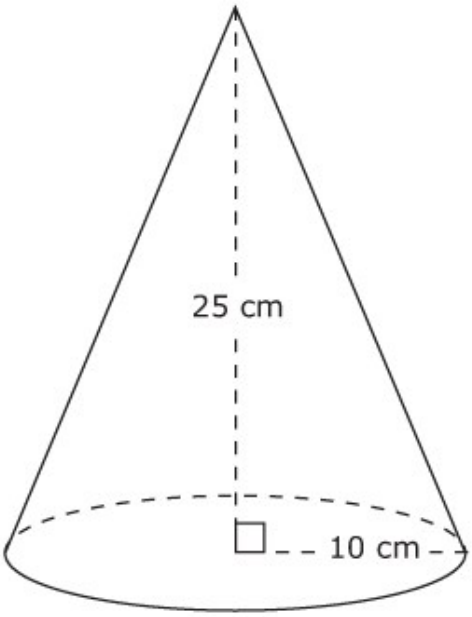
A. height of cylinder = 4 cm
height of cone = 12 cm

B. height of cylinder = 12 cm
height of cone = 3 cm

C. height of cylinder = 12 cm
height of cone = 16 cm

D. height of cylinder = 36 cm
height of cone = 12 cm

119. Use the diagram to answer the question.



What is the best approximation for the volume of the cone?

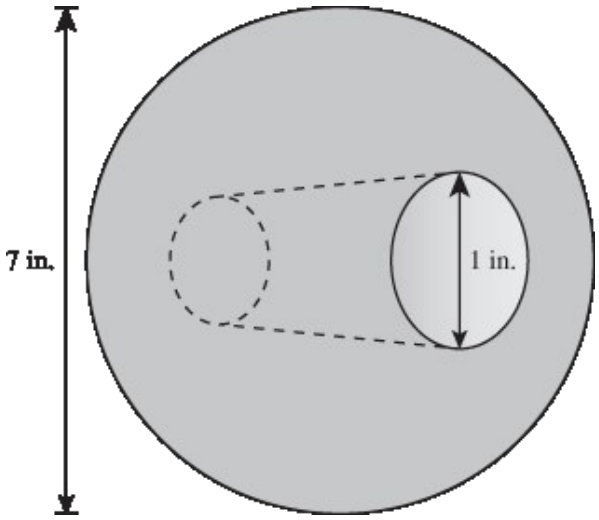
A. $524\ cm^3$

B. $654\ cm^3$

C. $2,618\ cm^3$

D. $6,545\ cm^3$

120. Mario's dog Buddy has a toy ball with a cylindrical hole through the middle to hold a treat.



The diagram is not drawn to scale.

The ball has a diameter of 7 inches. The cylindrical hole has a diameter of 1 inch. Which of the following is the best estimate of the volume, in cubic inches, of the ball without the treat section? Round to the nearest tenth.

A. 157.5 in.^3

B. 174.0 in.^3

C. 179.5 in.^3

D. 1414.0 in.^3

121. Andrea has a cylindrical jewelry box. The circumference of the base of the jewelry box is approximately 18.84 inches. The height of the jewelry box is 4 inches. What is the volume of the jewelry box? (Use 3.14 for π.)

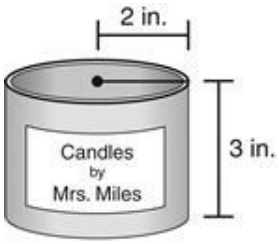
A. 75.36 cubic inches

B. 113.04 cubic inches

C. 452.16 cubic inches

D. 678.24 cubic inches

122. **Mrs. Miles makes a candle by placing wax in a glass container like the one shown below.**



If the radius of the glass container is 2 inches and the height is 3 inches, how much wax will she need to fill the container?

A. 6.00 cubic inches
B. 18.84 cubic inches
C. 37.70 cubic inches
D. 75.40 cubic inches

123. The students in a kindergarten class are filling sphere-shaped ornaments with glitter.

- There are 20 students in the class, and they are each making one ornament.
- Each ornament has a diameter of 3 inches.

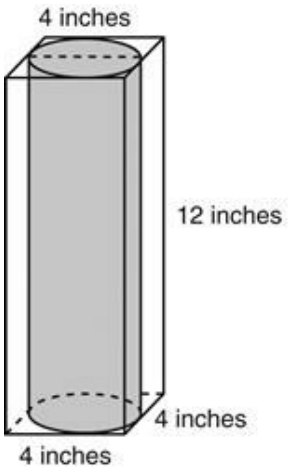
About how much glitter is needed to fill all the ornaments?

A. $2{,}262\ \text{in.}^3$
B. $283\ \text{in.}^3$
C. $251\ \text{in.}^3$
D. $188\ \text{in.}^3$

124. What is the ***approximate*** volume of a cylindrical storage tank that is 25 ft tall with a diameter of 50 ft?

A. $39{,}250\ \text{ft}^3$
B. $43{,}325\ \text{ft}^3$
C. $49{,}087\ \text{ft}^3$
D. $196{,}350\ \text{ft}^3$

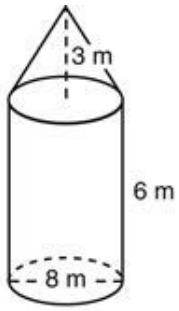
125. **Cory packed a cylindrical glass vase into a box like the rectangular prism shown below. He used packing material to fill the spaces between the vase and the box.**



Which formula could be used to find *M*, the volume of the packing material Cory used?

A. $M = 4\pi \times 12$
B. $M = 4 \times 4 \times 12$
C. $M = (4 \times 4 \times 12) - (4\pi \times 12)$
D. $M = (4\pi \times 12) - (4 \times 4 \times 12)$

126. **A water tank is a compound shape consisting of a cylinder and an inverted cone as shown below. The cylinder has a diameter of 8 meters (m) and a height of 6 m. The cone has a diameter of 8 m and a height of 3 m.**



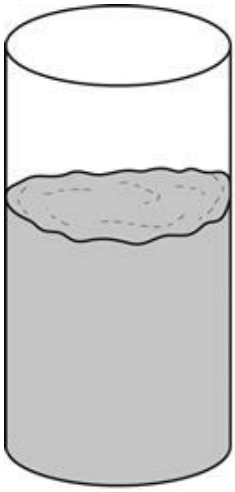
Note: Not drawn to scale.
What is the total volume of the tank in cubic meters? (Use $\pi \approx 3.14$)

A. 200.72
B. 301.44
C. 351.68
D. 452.92

127. **Daniel has a cylindrical container with a diameter of 10 inches. He fills it with sand to a depth of 6 inches. What is the volume, to the nearest cubic inch, of the sand in Daniel's container?**

A. 188 cubic inches
B. 246 cubic inches
C. 377 cubic inches
D. 471 cubic inches

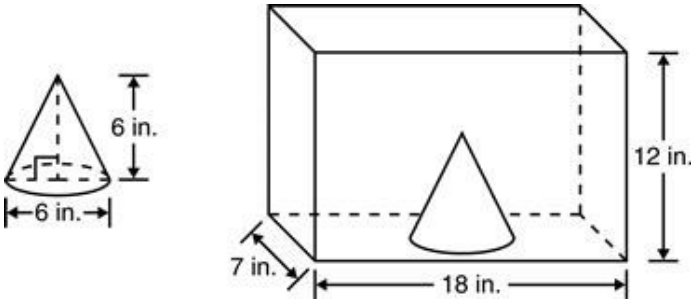
128. **Mrs. Corzine poured one cup of sand into the container shown each day the class had perfect attendance.**



If the container holds 16 cups of sand when full, which estimate is closest to the number of days the class has had perfect attendance?

A. 6
B. 8
C. 10
D. 14

129. **A solid cone was placed in the center of a rectangular fish tank as shown below.**



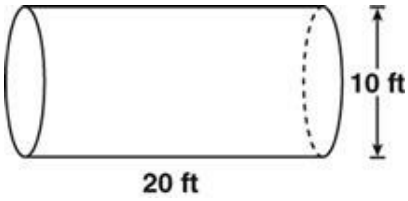
Which is closest to the maximum amount of water that the fish tank can hold?

A. 1,286 cubic inches
B. 1,455 cubic inches
C. 1,476 cubic inches
D. 1,569 cubic inches

130. A cylindrical-shaped hole is 42 feet deep and has a diameter of 5 feet. ***Approximately*** how large is the hole?

A. $210\ ft^3$
B. $630\ ft^3$
C. $825\ ft^3$
D. $3{,}300\ ft^3$

131. **What is the volume, in cubic feet, of this cylinder?**



A. 100π
B. 200π
C. 500π
D. 2000π

132. **Figure *A* is a view of Figure *B* from the bottom.**

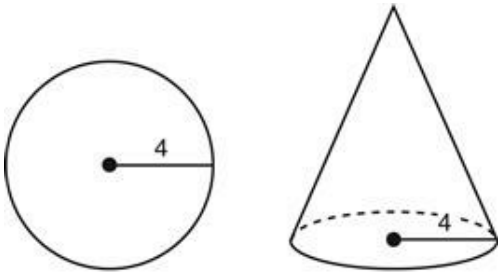


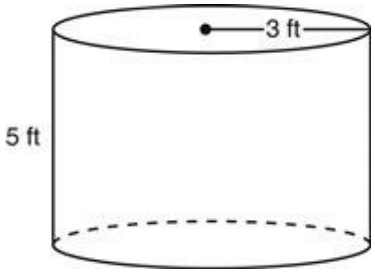
Figure *A* **Figure *B***

Which statement correctly describes one relationship between Figure *A* and Figure *B*?

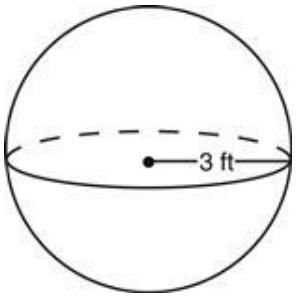
A. The diameter of Figure *B* is larger than the diameter of Figure *A*.
B. The height of Figure *B* is 3 times the height of Figure *A*.
C. Figure *A* is used in calculating the volume of Figure *B*.
D. Figure *B* has twice as many edges as Figure *A*.

133. **Which figure has a volume of** $45\pi \text{ ft}^3$?

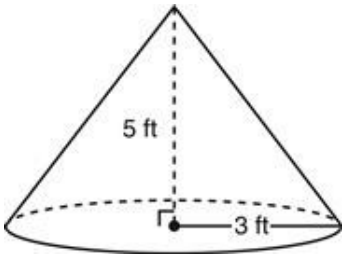
A.



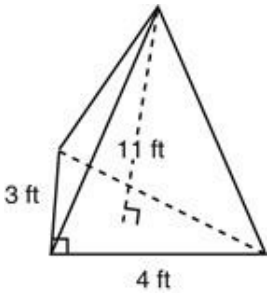
B.



C.



D.



134. Laura made two spherical pillows. Each pillow had a radius of 6 inches. ***Approximately*** what is the total volume of space Laura had to fill with stuffing?

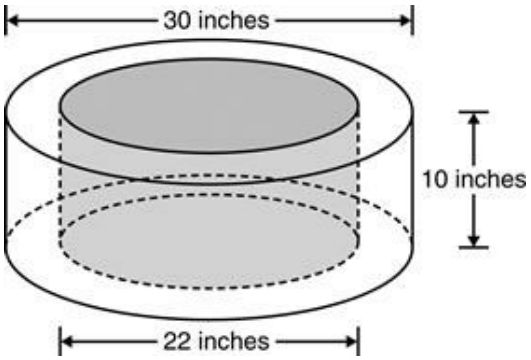
A. 150 in.^3

B. 905 in.^3

C. 1,020 in.^3

D. 1,810 in.^3

135. **A cylinder was removed from the inside of another cylinder to form the solid below.**



Which is the closest to the volume of the solid that remained?

A. 2,286 cubic inches
B. 3,266 cubic inches
C. 10,864 cubic inches
D. 13,062 cubic inches

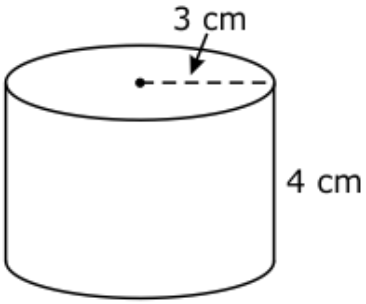
136. A cylindrical storage container has a height of 4 feet and a diameter of 2 feet. What is the ***approximate*** volume of the storage container?

A. $13\ ft^3$
B. $25\ ft^3$
C. $75\ ft^3$

137. **Chinh filled a cylindrical container with approximately 450 cubic centimeters of glitter. How many cubic centimeters of glitter would be needed to fill a cone with a base and a height congruent to the cylinder?**

A. 150
B. 225
C. 900
D. 1350

138. What is the ***approximate*** volume of the cylinder below?



A. $38\ cm^3$

B. $75\ cm^3$

C. $113\ cm^3$

139. Carlos is using a cylindrical plastic cup with a volume of 200 milliliters (mL) to water his plant. The height of the cup is 7 centimeters (cm). Given that 1 mL equals 1 cm^3, what is the diameter to the nearest centimeter of the circular base of his cup?

A. 3 cm

B. 6 cm

C. 9 cm

D. 10 cm

140. **What is the volume, in cubic feet, of a cone that has a base area of $\frac{\pi}{4}$ square feet and a height of 3 feet?**

A. $\frac{9}{4}\pi$

B. π

C. $\frac{3}{4}\pi$

D. $\frac{1}{4}\pi$

141. A cylinder-shaped tank has a radius of 3 ft and a height of 6 ft. What is the ***approximate*** volume of the tank?

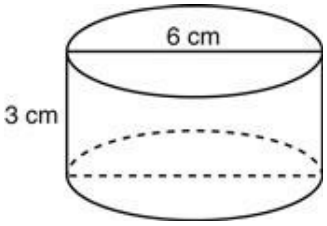
A. $57\ ft^3$

B. $113\ ft^3$

C. $170\ ft^3$

D. $340\ ft^3$

142. **What is the volume of this figure, in cubic centimeters?**



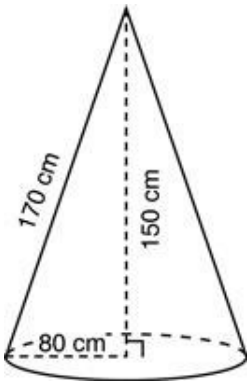
A. 9π

B. 18π

C. 27π

D. 36π

143. **Which equation represents the volume of the cone shown below, in cubic centimeters?**



A. $V = 80 \cdot 150 \cdot \pi$

B. $V = \frac{1}{3} \cdot \pi \cdot 80^2 \cdot 150$

C. $V = \frac{1}{2} \cdot \pi \cdot 80^2 \cdot 170$

D. $V = 80 \cdot 150 \cdot 170 \cdot \pi$

144. A cone has a radius of 4 cm and a height of 9 centimeters. What is the ***approximate*** volume of the cone?

A. $36\ cm^3$

B. $113\ cm^3$

C. $151\ cm^3$

145. **Carrie will fill $\frac{1}{2}$ of a flower vase with water. The cylinder-shaped vase has an inside height of 18 inches and a diameter of 6 inches. Which equation could be used to find *V*, the approximate volume in cubic inches, of the water Carrie will use in the vase?**

A. $V = \frac{3.14(36)(18)}{2}$

B. $V = 2(3.14)(36)(18)$

C. $V = 2(3.14)(9)(18)$

D. $V = \frac{3.14(9)(18)}{2}$

146. **The formulas for the volume of a cylinder and cone are shown below:**

Volume of cylinder: $V = \pi r^2 h$

Volume of cone: $V = \frac{1}{3}\pi r^2 h$

Based on these formulas, which scenario would not have been possible?

A. Huong used the water in 1 cylindrical can and was able to fill 3 cones of the same height and diameter as the can.

B. Ashley used a cone filled with small beads 3 times to fill a cylindrical plastic container with the same height and diameter as the cone.

C. Carlos filled a cylindrical can with about 235.5 cubic inches of oil, while a cone of the same height and diameter only held 78.5 cubic inches of oil.

D. Lincoln needed 3 congruent 100 cubic-inch cylinders of confetti in order to fill just 1 conical container that had the same height and diameter as the cylinders.

147. The world's largest ice cream cone was 10 feet tall and 3 feet in diameter. Ice cream weighs about 19.8 pounds per cubic foot. If this cone was filled with ice cream to the top without going over, ***approximately*** how many pounds of ice cream could this cone hold?

A. 467 pounds

B. 600 pounds

C. 1,400 pounds

D. 1,866 pounds