G.MG.2 *I can use the concept of density in the process of modeling a situation.*

1. Each side of a cube measures 3.9 centimeters. Its mass is 95.8 grams. Find the density of the cube. Round to the nearest hundredth if necessary.

a. 24.56 g/cm^3
b. 0.62 g/cm^3
c. 1.61 g/cm^3
d. 373.62 g/cm^3

2. Each side of a cube measures 2.6 centimeters. Its mass is 93.6 grams. Find the density of the cube. Round to the nearest hundredth if necessary.

a. 36 g/cm^3
b. 0.19 g/cm^3
c. 5.33 g/cm^3
d. 243.36 g/cm^3

G-MG.3- ***I can use geometric properties to solve real world problems***

3. Find the volume of a pizza box when given a surface area of 320 square inches, a height of 3 inches, and a square base of 300 cubic inches.

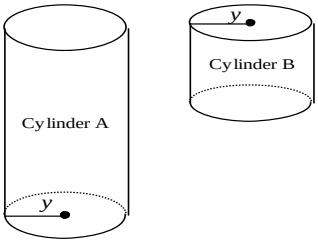
4. A cube has surface area of 486 square feet. What is its volume?

G-GMD.1- *I can explain the formulas for volume of a cylinder, pyramid, and cone by using dissection, Cavalieri's, informal limit argument.*

5. How could you use a stack of round drink coasters to demonstrate Cavalieri's Principle? Draw sketches to illustrate your answer.

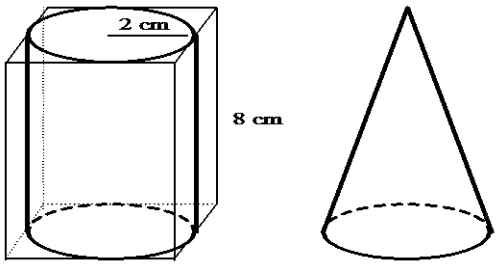
Coaster:

6. The height of Cylinder A is 26 feet. The height of Cylinder B is 14 feet. What is the ratio of the volume of Cylinder A to the volume of Cylinder B?



a. $\frac{13}{7}$
b. $\frac{13}{7}\pi$
c. $\frac{7}{13}$
d. $\frac{7}{13}\pi$

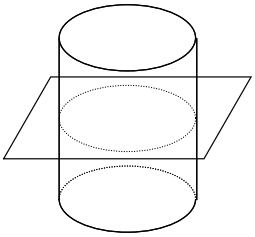
7. A square prism has a cylinder fitted inside it so that the square just touches the circle, as shown. The radius of the cylinder is 2 cm and its height is 8 cm.



Which has a greater volume: the part of the prism that is outside the cylinder, or a cone with the same radius and height as the cylinder? Justify your answer.

G-GMD.4: *I can identify shapes of 2-dimensional cross-section of 3-dimensional objects. I can identify 3-dimensional objects generated by rotations of 2-dimensional objects.*

8. Given the diagram below:



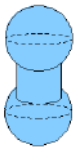
Part A: Describe the cross section.

Part 2: Sketch and describe the cross section if the plane was drawn perpendicular to the base of the cylinder.

9. Draw the solid of revolution formed by the shape rotated around the axis given.

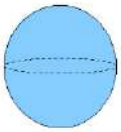
a.

b.

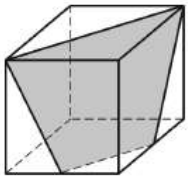


c.

d.

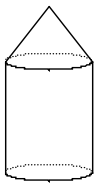


10. **Part 1:** What best describes the cross section shown on the cube?



Part 2: Describe or draw how you could get a rectangular cross section from the diagram above.

11. Draw the shape that would produce the solid below if rotated 360°. Make sure to label the axis of rotation.

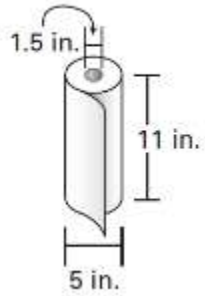


G-MG.1: *I can model real objects with geometric shapes.*

12. Find the volume of a cylinder with a base area of 49π inches squared and a height equal to twice the radius. If necessary, round to the nearest tenth.

Answer _____

13. A roll of paper towels is wrapped around a cardboard cylinder with a diameter of 1.5 in. The diameter of the whole roll of paper towels is 5 in. What is the volume of the paper on the role to the nearest cubic inch?

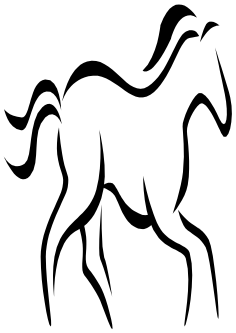


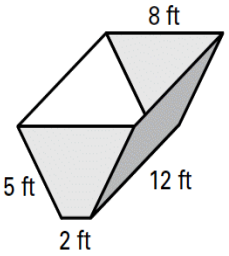
Answer:_____

14. The top of a tall building has four triangular faces that slope toward a single point. What shape best models the top of the building?

a. cube
b. cone
c. triangular pyramid
d. square pyramid

15. A water trough (container horses use to drink from) has two congruent isosceles trapezoids as ends and two congruent rectangles as sides.





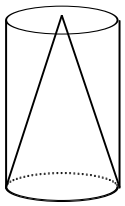
Part A: Find the exterior surface area of the trough.

Part B: Find the volume of the trough in cubic feet.

Part C: If the trough is emptied until the water level is even with the midsegment of the trapezoidal ends, how much water is left in the trough?

G-GMD.3- *I can use volume formulas for cylinders, pyramids, cones and spheres to solve problems.*

16. A cone is inscribed in a cylinder with radius 1.5 units and height 10 units, as shown.



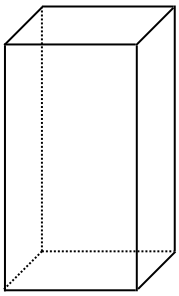
Part A: Find the volume of the cylinder.

Part B: Find the volume of the cone.

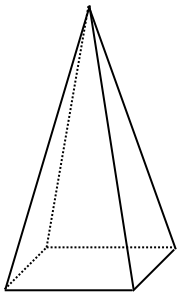
Part C: Find the ratio of the volume of the cone to the volume of the cylinder.

Part 2 Review

17. Evan has a popcorn container in the shape of a square prism that can hold 360 cubic inches. He also has some square-pyramid-shaped containers with the same height and base side lengths as the square prism. How many pyramid-shaped containers can he can fill from the prism-shaped container? Explain your answer.



Square prism



Square pyramid