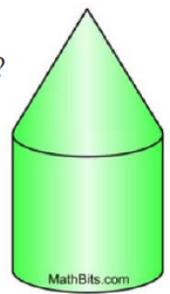
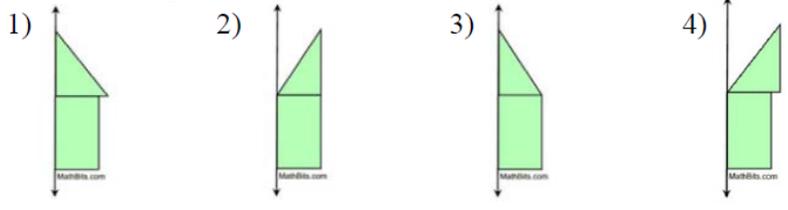


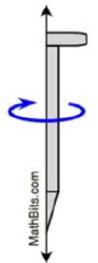
**MIXED APPLICATIONS PRACTICE**

1. Which 2-D shape could be revolved about the vertical line to create the 3-D solid at the right?

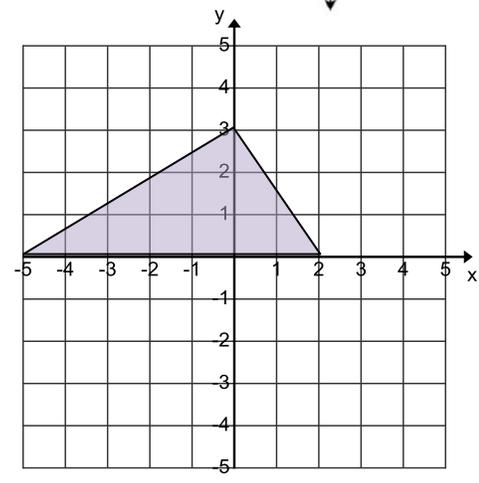


2. The 2-D figure at right is to be revolved about the vertical line. Which of the following descriptions best describes the 3-D solid formed by the rotation?

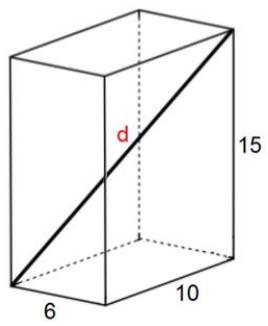
- 1) Nail                      2) Pencil                      3) Flagpole                      4) Golf Club



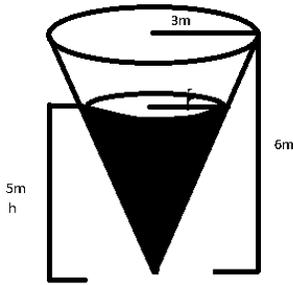
3. Find the volume generated by the 2-D triangle after it is rotated about the x-axis.



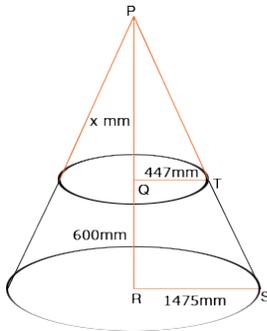
4. Find the length  $d$  in the right rectangular prism.



5. Find the radius of the cross section that is parallel to the base of the right cone located 5 m from the apex of the cone.



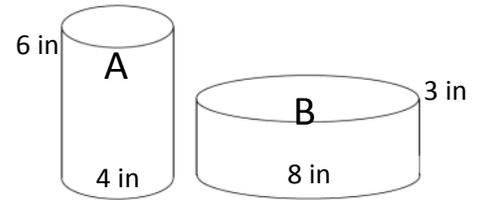
6. Find the value of  $x$  to the nearest tenth given that the cross sections are parallel in the right cone with altitude  $\overline{PR}$ .



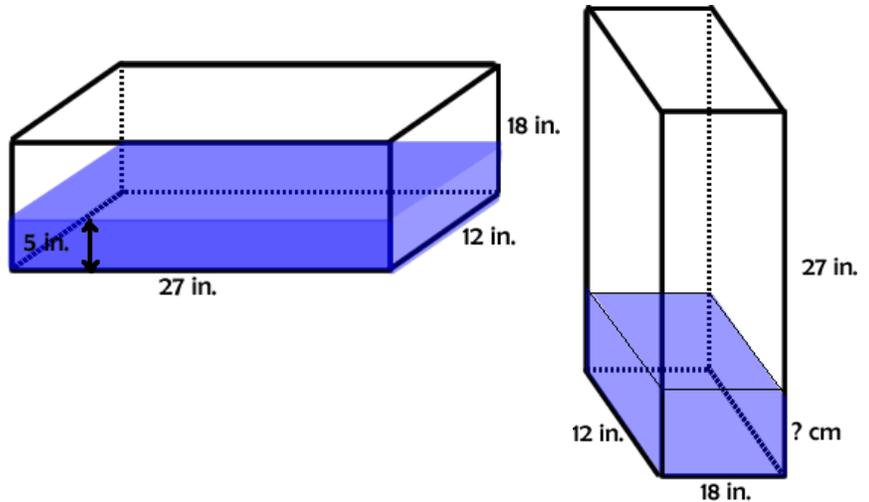
7. An ice cream cone is **11 cm** deep and **5 cm** across the opening of the cone. Two hemisphere-shaped scoops of ice cream, which also have diameters of **5 cm**, are placed on top of the cone (no ice cream was placed in the cone). If the ice cream were to melt into the cone, will it overflow? (M3 L12)

8. Gold has a density of **19.32 g/cm<sup>3</sup>**. If a square pyramid has a base edge length of **5 cm**, a height of **6 cm**, and a mass of **942 g**, is the pyramid in fact solid gold? If it is not, what reasons could explain why it is not? Recall that density can be calculated with the formula **density =  $\frac{\text{mass}}{\text{volume}}$** . (M3 L11)

9. Two jars of peanut butter by the same brand are sold in a grocery store. The first jar is twice the height of the second jar, but its diameter is one-half as much as the shorter jar. The jar A costs \$1.49, and jar B costs \$2.95. Which jar is the better buy? Explain your reasoning. (M3 L11)

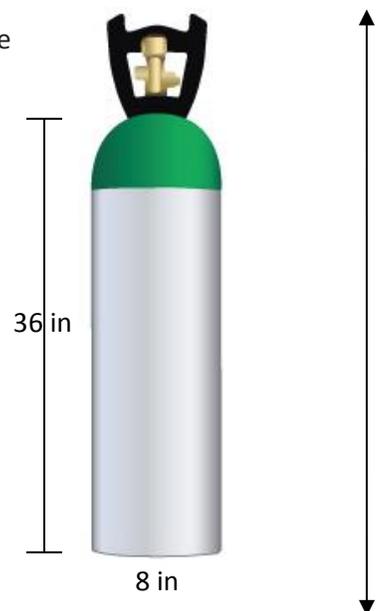


10. An enclosed right rectangular glass box contains  $1620 \text{ in}^3$  of water. When the glass box is tilted on its side the water shifts places. What is the relationship of the water before and after the tilting? What is the height of the water when the box is tilted upright?



11. Given the high pressure helium tank at right

- Draw the 2-D figure that would be rotated about the given axis to produce the oxygen tank without any of the nozzle. Consider the radius of the tank.
- What is the capacity of the tank, to the nearest hundredth of a cubic inch?



- If 12 cubic inches can fill a 12 inch round latex balloon, how many balloons will this tank fill?

12. A 40-foot long concrete sidewalk is being poured at a local school that is 5 feet wide and 4 inches deep. (Adapted from MathBits)



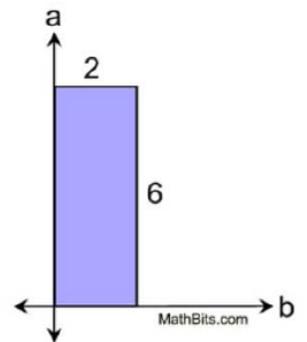
a. What solid will you use in this model?

\_\_\_\_\_

b. A concrete truck carries a load of 2.5 cubic yards of concrete. How many truck loads will the school have to order? Explain your reasoning. RECALL: 12 in = 1 ft ; 3 ft = 1 yard

c. The truck pours at a rate of 180 cubic yards per hour. How long will it take to pour the sidewalk?

13. Given the 2-D figure at right is a rectangle, and line a is perpendicular to line b. Which of the following statements are true? Circle ALL that apply:



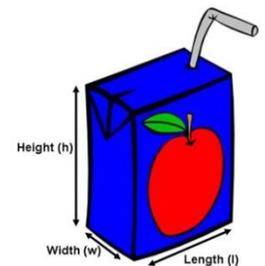
- a. When the rectangle is revolved about line b, a solid cylinder is formed.
- b. When the rectangle is revolved about line a, a rectangular prism is formed.
- c. The volume of the solid formed when the rectangle is rotated about line a is  $72\pi$  cubic units.
- d. The volume of the solid formed by rotating the rectangle about line a is equal to the volume formed by rotating the rectangle about line b.

14. A company is designing a new juice box with a width of 2 inches and a length of 3 inches.

a. What solid will you use in this model?

\_\_\_\_\_

b. If the height of the box is 4 inches and each box is filled to only 3.8 inches for head space, determine the volume of juice that will be needed for each box, to the nearest hundredth.



c. Juice has a density close to water,  $0.0361 \text{ lbs/in}^3$ . Using your answer from b, determine the mass of the juice in each box to the nearest hundredth of a pound.

d. The company wants to add a straw such that 1 inch will remain outside of the box to drink from. Determine the length of the straw needed to the nearest tenth of an inch. (Remember, the straw will need to be the diagonal of the solid).