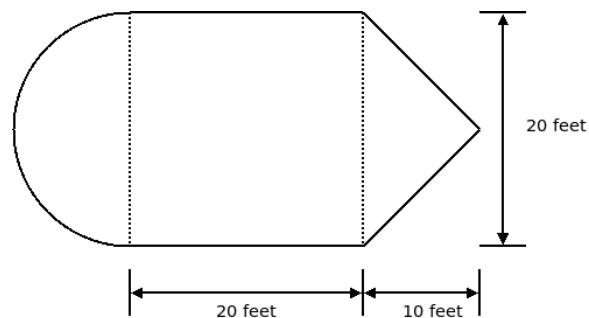


## Homework 10

Additional Practice Problems:

9A: 41-42, 47-50, 53-54, 57-58, 63-66, 75-81

- Mehmet just bought a new vacuum flask. It is 40 centimeters tall, and holds 1 liter of water. Agop's flask is the same design, but is only 30 centimeters tall. How much does it hold?
- Agop needs a new lab coat. Mehmet's lab coat is really nice, so Agop decides to copy it. Mehmet is 6 feet tall, and his lab coat used 16 square feet of fabric. If Agop is only 5 feet tall, how much fabric should he order?
- Agop and Mehmet are cymbal smiths at a cymbal company in Turkey. Their 16" crash has proven extremely popular, so they want to try scaling the design up to 18".
  - A 16" crash cymbal is 16 inches wide, and an 18" crash cymbal is 18 inches wide. If the 16" cymbal weighs 2.1 pounds, how much does the 18" cymbal weigh? (Bear in mind that when you scale the cymbal up, you have to make it thicker, too.)
  - It takes 5.5 square feet of cardboard to ship a 16" crash cymbal. How much cardboard does it take to ship an 18" crash cymbal?
  - A hard problem.** Agop and Mehmet have 1.8 pounds of metal left over once they have finished making their cymbals. How large a cymbal can they make with that, if they use exactly the same design as the 16" and 18" crash cymbals?
- Bosphorus Cymbals is thinking about having Agop and Mehmet do some contract work for them, but have asked to inspect the workshop first. Agop and Mehmet want to re-paint the workshop floor before the inspection. Here is a blueprint of the workshop:



- How many square feet of floor do they need to paint?
- Suppose they decide to repaint the trim along the edges of the floor, too. How many feet of trim do they need to paint?

5. Agop and Mehmet got the contract! Now they are going to replace their old furnace with a new one. Here are the three best options in the furnace catalog:
- A spherical furnace, 2 meters in diameter
  - A cylindrical furnace 1.5 meters tall, whose base is a circle with radius 1 meter
  - A furnace in the shape of a box, with base 6 feet square and height seven feet
- (a) Which furnace has the greatest capacity? (That is, which one has the greatest volume?)
- (b) The furnace company actually charges based on the amount of metal used to make the furnace – that is to say, the surface area. If they charge \$20 per square foot of surface area, how much will each furnace cost?
- (c) Which furnace is the best deal? (That is, which furnace has the lowest cost per cubic foot of volume?)