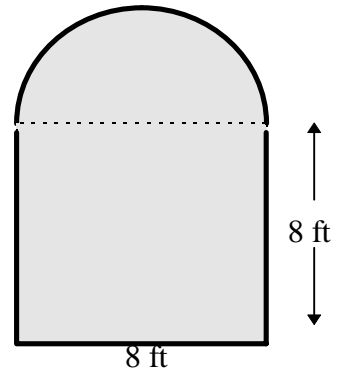


# Math 130

(7 points)

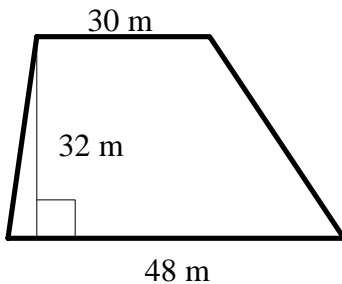
This enjoyable 100 point, fifty minute test covers assorted sections of *Mathematics: a Practical Odyssey* by Johnson and Mowry. Show your work and clearly indicate your answers. All parts of problems are five points unless otherwise indicated.

1. Find (a) the **area** and (b) the **perimeter** of this Norman window. (When necessary, round off answers to two places).



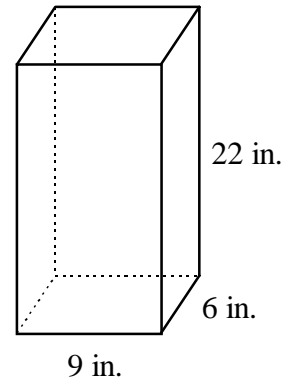
(a) Area = \_\_\_\_\_ (b) Perimeter = \_\_\_\_\_

2. Billy-Bob wants to fertilize his backyard. The yard is a rectangle with sides 80 feet and 270 feet. If one bag of fertilizer will cover 2400 square feet, **how many bags** does he need?



3. Find **the area** of the figure on the left.

4. Find (a) the **volume** and (b) the **surface area** of the indicated box.



a) Volume = \_\_\_\_\_                      b) Area = \_\_\_\_\_

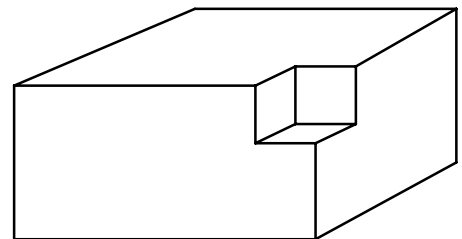
c) What is the longest object that will fit in the above box?

5. A cord of seasoned walnut cost \$360. You paid \$600 for a pile that was 3 feet wide, 5 feet tall and 13 feet long. (A cord is 128 cubic feet.)

a) Did you get an honest deal? **yes or no** (2 points)

b) What should **the price** have been?

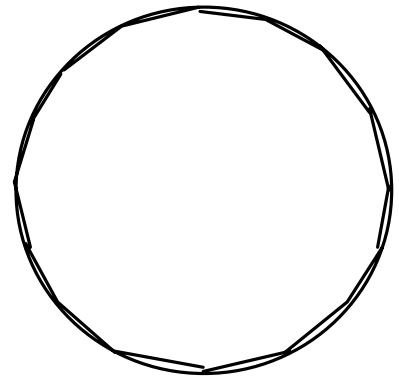
6. Find the volume and the surface area of the figure on the right.



9. When a regular 16 sided polygon is inscribed in a circle of radius  $r$  the length of the side is  $s = \sqrt{2 - \sqrt{2 + \sqrt{2}}} r$ .

a) **Approximate**  $\sqrt{2 - \sqrt{2 + \sqrt{2}}}$  using your calculator (Use four decimal place accuracy) (2 points)

b) Use the perimeter of this 16 sided polygon to **approximate  $\pi$**  to three decimal places.



10. A 20 foot ladder leans against a wall. If the top of the ladder reaches 12 feet up the wall, **how far** is the base of the ladder from the wall?

11. The given triangles are similar. Find the length of the missing side.

12. Find the area of the triangle on the right.

13. A polygon is a geometric figure made of lines enclosing a area. What is the least number of sides a polygon can have? (3 points each)
- a. **in the Euclidean geometry?**
  
  - b. **in the Riemanian geometry?**
  
  - c. **in Poincare's model of Lobachevskian geometry?**
14. Suppose you are given a line and a point not on that line. How many parallels to that line can be drawn through the given point? (3 points each)
- a. **in the Euclidean geometry?**
  
  - b. **in the Riemanian geometry?**
  
  - c. **in Poincare's model of Lobachevskian geometry?**