# MATH 191 – PRACTICE MIDTERM 2

**Name:**_____

FOR FULL CREDIT, SHOW ALL WORK
NO CALCULATORS

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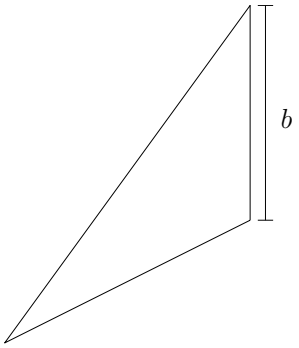
1. Victoria thinks that because one foot is 12 inches, one cubic foot is 12 cubic inches. Explain to Victoria why this is incorrect and explain how many cubic inches are actually in a cubic foot.

2. For the given triangle with the given choice of base $b$,

   (a) Label the height $h$.

   (b) Explain why the area of the triangle is $\frac{1}{2}bh$.



3. You have an 8.5" by 11" piece of paper that you are going to make into the sides of a cylinder with circular bases.

   (a) There are two possible cylinders you could make. What are the possible radii of the bases? (You may leave your answer in terms of $\pi$.)

   (b) For the cylinder with the base of largest radius, what is the total surface area of the cylinder (including the bases)?

   (c) Suppose you fold this piece of paper to make the sides of a triangular prism with equilateral triangle bases. If this prism has the same height as the cylinder you made in part (b), is its surface area (including the triangular bases) greater than or less than the surface area of the cylinder (again, including the bases)? You do not need to compute the actual surface area to answer this question.

4. You have drawn a map on $\frac{1}{4}$-inch graph paper. The scale of this map is 1 inch represents 10 miles. A certain national park on the map covers approximately 8 squares of the graph paper. What, approximately, is the area of the national park?

5. You have a scale model for the Great Pyramid of Giza. The model has a square base with each side length 20 cm. The height of the model (the distance from the apex to the middle of the base) is $5\sqrt{5}$ cm. Suppose you want to paint the pyramid with special paint which would cost \$2 per square meter. If you paint the entire pyramid, including the base, how much will it cost you?

   (It may interest you to know some squares:

   $11^2 = 121$ $12^2 = 144$ $13^2 = 169$ $14^2 = 196$ $15^2 = 225$

   $16^2 = 256$ $17^2 = 289$ $18^2 = 324$ $19^2 = 361$ $20^2 = 400$)