Measurement Worksheet III   Name:_____

MA 202
Spring Semester 2004

WARNING: You must **SHOW ALL OF YOUR WORK**. You will receive NO CREDIT if you do not show your work.
DUE: ????

1. You should be able to do problems similar to numbers 1–5 and 12–13 in Section 12.3 of your textbook. I will not collect these problems.

2. Do problem 4c in Section 12.3 of your textbook. (**HINT:** *What is the radius of the sphere? Draw a radius that is not labeled.*)

3. Do problems 6–9, 10a, 14, and 15 in Section 12.3 of your textbook.

4. Do problem 25 in Section 12.3 of your textbook.

5. Read Section 12.4 of your textbook.

6. (a) Draw four different nets for the Polydron cube you are given.
   (b) Use the nets to find the surface area of the cube.
   (c) Use the net to verify that the surface area of the cube is

   $$(2 \times \text{ area of the base }) + (\text{ perimeter of the base } \times \text{ height of the cube}).$$

7. (a) Draw two nets for a the Polydron rectangular prism (which is not a cube) you are given. (Could you draw more nets for this rectangular prism?)
   (b) Use the nets to verify that the surface area of this rectangular prism is

   $$(2 \times \text{ area of the base }) + (\text{ perimeter of the base } \times \text{ height of the prism}).$$

8. (a) Draw two net for a the Polydron triangular prism you are given. (Could you draw more nets for this triangular prism?)
   (b) Use the nets to verify that the surface area of this triangular prism is

   $$(2 \times \text{ area of the base }) + (\text{ perimeter of the base } \times \text{ height of the prism}).$$

9. (a) Use Polydron to construct a tetrahedron.
   (b) Draw a net for your tetrahedron. (Could you draw more than one net for this tetrahedron?)
   (c) Use the net to find the surface are area of your tetrahedron.

10. Consider the cylinder and the sphere in your set of Power Solids or Relational GeoSolids.

    (a) How does the diameter of the cylinder compare with the diameter of the sphere?

    (b) How does the height of the cylinder compare with the diameter of the sphere?

    (c) Fill the sphere with rice. Dump this rice into the cylinder. Compare the volumes of the cylinder and the sphere.

11. Consider the cube and the pyramid with the square base in your set of Power Solids or Relational GeoSolids.

    (a) How does the base of the pyramid compare with the base of the cube?

    (b) How does the height of the pyramid compare with the height of the cube?

    (c) Fill the pyramid with rice. Dump this rice into the cube. Compare the volumes of the pyramid and and cube.

12. Consider the cylinder and the cone in your set of Power Solids or Relational GeoSolids.

    (a) How does the diameter of the base of the cone compare with the diameter of the cylinder?

    (b) How does the height of the cone compare with the height of the cylinder?

    (c) Fill the cone with rice. Dump this rice into the cylinder. Compare the volumes of the cone and the cylinder.

13. There are three patterns given in problem 10 of Section 11.3. Use multilink cubes to construct the three objects that correspond the patterns. Find the surface area and volume of each object.

14. Construct various objects using eight multilink cubes. Which object has the minimum surface area? The maximum surface area? The minimum volume? the maximum volume?

15. Construct various objects using six multilink cubes. Which object has the minimum surface area? The maximum surface area? The minimum volume? the maximum volume?

16. (a) Do problem 5 from section 12.1.

    (b) Replace the word "volume" with the phrase "surface area" in problem number 5 of Section 12.1 and repeat the exercise.

17. Do problems 1–5, 6,7, 10, 11, and 13–15 in Section 12.4.