MA202 Problem set 10

April 7, 1999

Below are a few more problems, related to geometry. I hope to finish most of these before our third test on Tuesday, April 20. Problem set 9 is due on Tuesday, April 13. The set below is tentatively due on Thursday, April 15.

1. (Problem 29, section 10.1) A plumb bob suspended from the center of a protactor can be used to measure the angle of elevation of a tree top. If the string crosses the protractor's scale at the angle marked P, what is the measure of the angle of elevation? (Refer to the text for the picture which defines the angle P.)

2. In an earlier problem set, we constructed a figure using four equilateral triangles. Several people gave the following picture as an answer. Why is this not possible?

3. (Section 10.3, #18b) Show that the L-shaped figure below is a reptile. This means that several copies of the figure can be arranged to make a larger shape which is similar to the original figure. See the problem in the text for several examples of reptiles.

4. Find the area of a regular hexagon with sidelength one inch. To do this, divide the hexagon into simpler pieces. Hint: You will need to know that if a right-triangle has angles of 30°, 60° and 90° and its longest side or hypotenuse is 1, then the remaining sides are of length $1/2$ and $\sqrt{3}/2$.