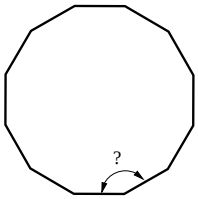
Quiz 10 MAT 118, Spring 2003

**PRINT your Name:** Solution

1. What is the measure of the angle of a regular dodecagon? Remember that a dodecagon has 12 sides.




**Solution:** Using the formula, we have

$$180 - \frac{360}{12} = 180 - 30 = 150,$$

so the angles in a regular dodecagon are 150 degrees.

2. Is it possible to make a semiregular tiling of the plane so that two dodecagons and some other regular polygon meet at each vertex? If so, what is that polygon? If not, just write NO.

**Solution:** If it is possible, we have two dodecagons meeting at each vertex. Since we have a total of 360 degrees, and the dodecagons take up 150+150=300 degrees, there are only 60 degrees left. This means that if it is possible, only an equilateral triangle could work; everything else has too large an angle.

Now, will the equilateral triangle work? Yes, it will. We just have to check that as we go around the dodecagon, we don't run into problems. Each side alternates between having a dodecagon or a triangle attached to it, and since there are an even number of sides, it all works out.

A picture of the tiling is below (but you don't need it to do the problem.)