Quiz #9. Math 104, Symmetry, Shape, and Space.
Instructor: Ramin Naimi

Name: ______________________________
Fri 30 Nov 2001

Closed book. Closed Notes. 20 points per problem. Please write very legibly.

Do **only two** of the following problems.

Please circle the two problems you are choosing:

1. **2**. **3**.

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1. (a) What is a *regular* tiling of the plane?
   (b) What are all possible regular tilings of the plane?
   (c) Explain why there can't be any others than the ones you listed above.
2. (a) What is a *semiregular* tiling of the plane?
   (b) What is the largest number of different *types* of regular polygons that a semiregular tiling can have at each vertex? Explain why.
   (c) Explain why it is impossible to have a semiregular tiling of the form $5.m.n$ if $m \neq n$.
3. (a) Draw a picture of the semiregular tiling 4.8.8 with at least five complete vertices. By a *complete vertex* we mean a vertex for which all the polygons touching it have been drawn.
   (b) Is it possible to have a semiregular tiling with five polygons at each vertex, only two of which are triangles? Explain why.
   (c) How many ways are there to have four polygons, only one of which is a triangle, at one vertex? Explain why. (This is only asking that the angles add up to 360°; not whether or not it can actually be a semiregular tiling.)