Quiz #4.   Math 104, Symmetry,
Shape, and Space.
Instructor: Ramin Naimi

Name: _____

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

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

Please circle the three problems you are choosing:

1.   **2**.   **3**.   **4**.

1. Draw all lines of reflection for a regular hexagon.

2. Give instructions for dividing a given line segment AB into three equal pieces. You may use other constructions without giving instructions for them.

3. Given a line segment AB of unit length, give instructions for constructing a line segment whose length is the golden ratio: $\phi = (1 + \sqrt{5})/2$.

4. Suppose triangle ABC satisfies the following:

   - $\angle BAC = \pi/5$
   - $\angle ABC = \angle ACB = 2\pi/5$
   - D is a point on AC such that BD bisects $\angle ABC$

   Show $\dfrac{AC}{BC} = \dfrac{BC}{DC}$.