Problem Set

1. Write a clear set of steps for the construction of an equilateral triangle. Use Euclid's Proposition 1 as a guide.

2. Suppose two circles are constructed using the following instructions:

   Draw circle: Center A, radius AB.

   Draw circle: Center C, radius CD.

   Under what conditions (in terms of distances AB, CD, AC) do the circles have

   a. One point in common?

   b. No points in common?

   c. Two points in common?

   d. More than two points in common? Why?

3. *You will need* a compass and straightedge

   Cedar City boasts two city parks and is in the process of designing a third. The planning committee would like all three parks to be equidistant from one another to better serve the community. A sketch of the city appears below, with the centers of the existing parks labeled as P_1 and P_2. Identify two possible locations for the third park and label them as P_{3a} and P_{3b} on the map. Clearly and precisely list the mathematical steps used to determine each of the two potential locations.