Names: _____   Group #: _____

1. A 432-m^2 rectangular patch is to be enclosed by a fence and divided into two equal parts by another fence parallel to one of the sides. What dimensions for the outer rectangle will require the smallest total length of fencing material needed? How much fencing material will be needed?

2. You have been asked to design a can shaped like a right circular cylinder that can hold a volume of $1,024\pi$-cm^3. What dimensions of the can (radius and height) will use the least amount of material?

   (Hint: The least amount of material will be the smallest surface area.)

3. You are designing a rectangular poster meant to contain a 60-in^2 area of text enclosed by a 3-inch margin at the top and bottom of the poster and a 5-inch margin at each side. What overall dimensions of the poster will minimize the amount of paper used?