Calculus I **Optimization** Name:

1. You want to make a box by cutting small squares from each corner of a sheet of tin and then bending up the resulting flaps. If the tin measures 10 inches by 16 inches, how should big should your cuts be to create the box with the greatest volume?

2. You want to make a closed box with a square base and square top. The material for the sides costs 2 cents per square inch, the material for the top costs 3 cents per square inch, and the material for the bottom costs 4 cents per square inch. If you have at most \$15 to spend, what dimensions of the box will produce the greatest volume?

3. You have a piece of rope 100 inches long. You want to cut the rope and make a circle from one piece and a square from the other. Where should you cut the rope so that the area of the square plus the area of the circle is as large as possible?