1. An open storage bin with a square base and vertical sides is to be constructed from 108 square feet of material. Determine its dimensions if its volume is to be a maximum.

2. Find the point (x, y) on the graph of $y = \sqrt{x}$ nearest the point (4, 0).

3. A piece of wire 35-m long is cut into two pieces. One piece is bent into a square and the other is bent into an equilateral triangle. How should the wire be cut so that the total area enclosed is a minimum?

4. A square piece of tin has 10 in on a side. An open box is formed by cutting out equal square pieces x in on a side at the corners and bending upward the projecting portions which remain. Find the maximum volume that can be obtained.

5. If y = 2x-8, what is the minimum value of the product xy?