Optimization Practice Problems

1. A giant cereal box with an open top is to have a volume of 10 m^3. The length of the base is twice the width. Material used for the base costs \$10 per square meter and material for the sides costs \$6 per square meter. Find the cost of materials for the cheapest such container. (Your function is cost, not surface area.)

2. Dwight is trying to save money for Dunder Mifflin by constructing an open paper box from a square piece of cardboard, 24 in. on a side, cutting equal squares from the corners and turning up the sides. Find the largest volume that can be produced by this process.

3. Which point on the graph of $y = \sqrt{x}$ is closest to the point $(4,0)$?