

11. (12 points) Ms. Manufacturer, a producer of diamond-studded widgets, finds that her company can sell q widgets per week if they are priced at p each, where

$$q = 100 - 2p$$

and p is in hundreds of dollars. Her cost, also measured in hundreds of dollars, for producing q widgets is

$$C(q) = 100 + 10q + \frac{1}{2}q^2.$$

(a) How many widgets should her company manufacture each week to achieve the least cost per widget? That is, the least average cost. (Be sure to show your work.)

(b) Determine the formula for the revenue $R(q)$ received each week if q widgets are sold.

(c) How many widgets should Ms. Manufacturer's company produce each week in order to maximize profits? At what price should the widgets be sold?