

Section 4.4

Profit, Cost, Revenue

1. You run a small furniture business. You sign a deal with a customer to deliver up to 400 chairs, the exact number to be determined by the customer later. The price will be \$90 per chair for orders of 300 chairs or less. For larger orders, the price will be reduced by \$.25 per chair (on the whole order) for every additional chair over 300. [For example, for 300 chairs, the total cost of the order is (300 chairs)·(\$90 per chair) = \$27,000. For 305 chairs, the total cost of the order is (305 chairs)·(\$88.75 per chair) = \$27,068.75 .] What are the largest and smallest revenues your company can make under this deal?

2. The quantity demanded each month of the Walter Serkin recording of Beethoven's Moonlight Sonata, manufactured by Phonola Record Industries, is related to the price/compact disc. The equation $p = -.00042x + 6$ ($0 \leq x \leq 12000$) where p denotes the unit price in dollars and x is the number of discs demanded, relates the demand to the price. The total monthly cost (in dollars) for pressing and packaging x copies of this classical recording is given by $C(x) = 600 + 2x - 0.00002x^2$ ($0 \leq x \leq 20000$). To maximize its profits, how many copies should Phonola produce each month?