

Assignment 9

Solutions to *all* the following problems should be written up and hand in to your TA.

Due in recitation on Thursday, November 1, 2001

Section 4.5: Problems 6, 15, 18, 28, 41

Section 4.7: Problems 4, 10, 12

Supplementary Problems*:

1. A manufacturer can produce at most 120 units of a certain product each year. The demand equation for the product is

$$p = q^2 - 100q + 3200,$$

and the manufacturer's average cost function is

$$\bar{c} = \frac{2}{3}q^2 - 40q + \frac{10000}{q}.$$

Determine the profit-maximizing output q and the corresponding maximum profit.

2. The Kiddie Toy Company plans to lease an electric motor that will be used 90,000 horsepower-hours per year in manufacturing. (One horsepower-hour is the work done in 1 hour by a 1-horsepower motor.) The annual cost to lease a suitable motor is \$150 plus \$0.60 per horsepower. The cost per horsepower-hour of operating the motor is $\frac{0.006}{N}$, where N is the horsepower that the motor has. What size motor, in horsepower, should be leased in order to minimize cost?

*Problem taken from *Introductory Mathematical Analysis for Business, Economics, and Life Sciences*, ERNEST F. HAEUSSLER, JR. & RICHARDS S. PAUL (Eighth Edition)