

Handout # 2: Prepared by Mohammad Madiah
Sections 1.6 and 2.3 additional problems

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1. The cost of manufacturing 100 units of a product is \$3000. When 600 units are produced, the cost is \$5000. Find the **cost equation** (assuming linear cost model).
 2. Suppose that consumers will demand 100 units of a product when the price is \$10 per unit, and 120 units when the price is \$8 per unit. Assuming that price p and quantity q are linearly related, find the **price** at which 90 units are demanded.
 3. Suppose that a manufacturer sell a product for \$12 per unit. If the fixed cost is \$1600 and the variable cost is \$8 per unit find the **profit (or loss)** of selling 500 units.
 4. Suppose a manufacturer will not market any unit of a product if the unit price is \$120 or lower, but is willing to market 50 at \$180 per unit. Find the linear **supply** equation.
 5. If the revenue function is $R(x) = 80x - 0.2x^2$, find the **quantity demanded** when the price is \$40.
 6. The cost and revenue functions for producing x number of battery packages are given by $C(x) = 5x + 60,000$ and $R(x) = 25x$; respectively. Find the **break-even point**
 7. How **many items** does the company have to manufacture and sell to **not lose** money if the revenue function is $R(x) = 200x - 0.25x^2$ and the cost function is $C(x) = 40x + 9975$?
What is the **maximum profit**?
 8. A company has a profit function given by $p(x) = -100x^2 + 1000x - 2400$. Find the sales levels (i.e. x -values) where the company is **not losing money**.
 9. Suppose you are given the supply and demand curves, respectively, $p - 4x = 5$ and $2p + 4x = 162$ ($x = \#$ of units, $p =$ price in dollars).
 - a. At $p = \$53$, is there a shortage or surplus?
 - b. Is the price likely to increase from \$53 or decrease from it?
 - c. What is the equilibrium point?
 10. Suppose consumers purchase q units of a manufacturer's product when price per unit (in dollars) is $60 - 0.5q$. If no more than 75 units can be sold, find the number of units that must be sold in order that the revenue be \$1000
 11. A manufacture sells his product at \$23 per unit. His fixed cost is 418000 and his variable cost per unit is \$18.5. The level of production at which the manufacture break-even is
 12. If the supply and demand functions for a product are given by $6p - q = 60$ and $(p + 2)q = 4830$, respectively, find the price that will result in market equilibrium.
 13. If the supply function is $p = x + 5$, and the demand function is $p = 25 - x^2$, find the **equilibrium point**.