

### Section 1.4 – Lecture Notes/Examples

Set up and solve an equation(s) to solve the following problems. Be sure to declare all variables and answer all word problems in complete sentences.

1. A manufacturer can sell a certain product for \$110 per unit. Total cost consists of a fixed overhead of \$7,500 plus production costs of \$60 per unit.
  - a. Express the cost  $C(x)$ , the revenue  $R(x)$ , and the profit  $P(x)$  as functions of the number of units  $x$  that are produced and sold.
  - b. How many units must be sold for the manufacturer to break even. (Revenue = Cost)
  - c. What is the manufacturer's profit or loss if 100 units are sold?
  - d. How many units must be sold for the manufacturer to realize a profit of \$1250?
2. The spread of an epidemic. The rate at which an epidemic spreads through a community is jointly proportional to the number of people who have caught the disease and the number who have not. Express this rate as a function of the number of people who have caught the disease.
3. A closed box with a square base has a surface area of 4,000 square centimeters. Express its volume as a function of the length of its base.
4. A soda can holds 12 fluid ounces (about  $6.89\pi$  cubic inches). Express the surface area of the can as a function of its radius.

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