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.

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.