

Math 109 Assignment One

Name: _____

Assignments must be completed on this paper.

Attach extra pages if necessary.

Show all your work for full marks.

Coverage: 1.1-1.4 and 2.1-2.3

1. [4 marks] A company van is valued at $y = 32,000 - 1620x$, where y is in dollars and x is the number of years after 2015.

a) What will be the value in 2020?

b) In which year will the value be \$10,940?

2. [4 marks] Graph the feasible set for the following system of inequalities:

$$\begin{aligned}x &\geq 0 \\-2x + y &\geq -4 \\x + \frac{1}{3}y &\leq 3\end{aligned}$$

3. [3 marks] Manufacturer A can produce a product for a cost of \$4400 plus \$8 per unit. Manufacturer B can produce the same product for a cost of \$4010 plus \$11 per unit. How many units result in the two costs being equal? What is the cost for that number of units?

4. [3 marks] Demand for a commodity is 72,000 units at a price of \$2.30 and 65,000 units at a price of \$3.21. Let x be the quantity in thousands and y be the price in dollars. Find the equation of the demand line.

5. [6 marks] A juice bar makes two types of smoothies. A tropical smoothie consists of 12 units of pineapple juice and 8 units of orange juice and yields a profit of \$4. A wake-up smoothie consists of 6 units of pineapple juice and 7 units of orange juice and yields a profit of \$3. The juice bar has 96 units of pineapple juice and 70 units of orange juice available each day. How many of each smoothie should be produced each day to maximize profit? What is the maximum profit?