King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 131 (151)
Instructor: Dr. Bilal Chanane
Major Exam I

Name:.....ID:.....

Exercise 1 *(10 pts) A total of \$16300 was invested in two businesses, A and B. At the end of the first year, A and B returns 7.3% and 3.8 % respectively, on the original investment. How was the original amount allocated if the total amount earned was \$976.4 ?*

Exercise 2 *(10 pts) A cloth manufacturer is planning to sell its new line of jeans to retail outlets. The cost to the retailer will be \$1.64 per pair of jeans. As a convenience to the retailer, the manufacturer will attache a price tag to each pair. What amount should be marked on the price tag so that the retailer can reduce this price by 18% during a sale and still make a profit of 36% on the cost ?*

Exercise 3 *(9 pts) In supply (and demand) problems, x is the number of items the supplier will produce (or the consumer will buy) if the price of the item is y . For a particular product, the supply equation is $y = 5x + 435$ and the demand equation is $y = -3x + 587$. What is the selling price and the number of items when supply and demand are in equilibrium?*

Exercise 4 *(12 pts) In supply (and demand) problems, x is the number of items the supplier will produce (or the consumer will buy) if the price of the item is y . For a particular product, the supply equation is $y = 2x + 50$ and the demand equation is $y = \frac{300}{x}$. What is the selling price and the number of items when supply and demand are in equilibrium?*

Exercise 5 *(9 pts) Let the demand function of a product be given by $y = -1.1x + 240$, where x is the number of items in demand and y the price per item, in Dollars, that can be charged when x units are sold. Suppose the fixed cost of production of the item is \$4000 and the variable cost is \$8 per item produced. If 135 items are produced and sold, find (1) the total revenue from selling 135 items (to the nearest penny) and (2) the total cost to produce 135 items (to the nearest penny) and the total profit to produce 135 items (to the nearest penny).*

Exercise 6 *(9 pts) The demand equation for a certain product is given by $p = 102 - 0.085x$, where p is the unit price (in Dollars) of the product and x is the number of units produced. (1) Determine the price p that would yield a revenue of 8090 Dollars. (2) Find the lowest and highest price.*

Exercise 7 *(9pts) The cost (in Dollars) for a company to produce and sell x thousand gadgets is given by $y = \frac{1}{50}x^2 - 2x + 4550$. (1) What is the company start-up cost? (2) What is the minimum cost? (3) How many gadgets must the company produce and sell in order to incur the least cost?*

Exercise 8 *(8pts) Solve the system of equations*

$$\begin{cases} 6x + 8y = 48 \\ 5x + 7y = 35 \end{cases}$$

Exercise 9 *(12pts) Solve the system of linear inequalities*

$$\begin{cases} 4x + 5y \leq 20 \\ 3x + 6y \leq 18 \\ x + y > 2 \\ x \geq 0 \ , \ y \geq 0 \end{cases}$$

Exercise 10 *(12pts) Solve the system of linear inequalities*

$$\begin{cases} 6x + 8y \leq 48 \\ 5x + 7y > 35 \\ 4x + 9y > 36 \end{cases}$$