Math 109-D04
Assignment 3

Deadline: Wed Mar 24, 2:30pm Pacific Time
Submit on D2L

Number of Questions: 5
Total Marks: 17

Show all your work for full marks.
You MAY use the course website (notes, videos etc) and your own notes
You may NOT copy from others (classmates, tutors, Google, Chegg etc)

Submit jpg or pdf files
Feel free to handwrite your solutions and take photos of your work

Covers Sections 1.3, 1.4, 2.1, 2.2, 6.1-6.3

1. [2 marks] Let q represent quantity (in thousands) and let p represent price (in \$). The demand curve for a commodity is $p = -0.03q + 41.9$. The supply curve for the same commodity is $p = 0.012q + 21.74$. Find the equilibrium quantity and price.

2. [4 marks] The cost of making 250 tablets is \$86450. The cost of making 675 tablets is \$224575. Let x be the number of tablets made and let y be the cost in \$. Find the equation of the line.

3. [4 marks] A company makes surfboards and paddleboards. Each surfboard takes 6 hours to manufacture and 2 hours to dye and generates \$52 of profit. Each paddleboard takes 12 hours to manufacture and 3 hours to dye and generates \$88 of profit. Each day the company has 102 manufacturing hours and 30 dyeing hours available. Let x be the number of surfboards made each day. Let y be the number of paddleboards made each day.

a) Write down the function that represents daily profit.
b) List all the inequalities that apply.
c) The feasible set has vertices $(0, 0), (0, 8.5), (15, 0)$ and $(9, 4)$. What is the maximum daily profit?

4. [4 marks] Solve using Gauss-Jordan Elimination:

$$\begin{array}{rcl} 2x + 8y + 4z &=& 28 \\ 3x + 3y + 6z &=& 15 \\ 13x + 25y + 26z &=& 101 \end{array}$$

5. [3 marks] Calculate AB and BA. If they are undefined, say so.

$$A = \begin{bmatrix} 2 & -3 & 4 \\ -4 & 2 & 6 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -2 \\ 7 & 3 \end{bmatrix}$$