PRINCE SULTAN UNIVERSITY

Finite Mathematics MATH 101

First Major Exam

NAME _____ ID _____

Q1. Find a general equation for the line having the given properties.

a) Contains the two points (–2, 3) and (1, 2)

b) Parallel to the line 2x – y = 5 and passing through (–1, 2).

Q2. The cost to the Arab News newspaper home delivery is approximately SR 0.25 per newspaper with fixed costs SR 2,012,124. Find the cost of delivering 23,123 newspapers.

Q3. A manufacturer produces items at a daily cost of $1.25 per item and sells them for $2 per item. The daily operational overhead is $450. What is the break-even point?

Q4. Solve the following system by finding the reduced echelon form of the augment matrix

$$\begin{aligned} 2x - 3y + 4z &= 7 \\ x - 2y + 3z &= 2 \end{aligned}.$$

Q4. Determine whether each system has a unique solution, no solution, or infinitely many solutions. If a solution exists, write it down.

a)
$$\begin{aligned} x - y - 2z &= 1 \\ 2x + 3y + z &= 2 \\ 3x + 2y &= 0 \end{aligned}$$

b)
$$\begin{aligned} x - 2y + z &= 2 \\ -x + y + 5z &= 1 \\ x - 3y + 7z &= 0 \end{aligned}$$

Q6. Given he matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 1 & 2 \\ 2 & 0 & 2 \end{bmatrix}$.

a) Find the inverse of A.

b) Solve the system $\begin{aligned} x+2y+z &= 2 \\ x+y+2z &= -4. \\ 2x+2z &= 0 \end{aligned}$

Q7. Graph the system of inequalities.

$$\begin{cases} x+y \le 4 \\ 2x+y \le 6 \\ x \ge 0 \\ y \ge 0 \end{cases}$$