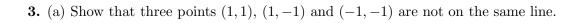
Math 104 Name(PRINT!)______ Midterm 1, Feb 6

1. Graph the following system of linear inequalities:

$$\begin{cases} y - x \ge 1 \\ y + x \ge 2 \\ y \le 3 \end{cases}$$

- **2.** A straight line passes through two points (1,1) and (2,3).
- (a) Calculate the slope of this line.
- (b) What is the corresponding equation of this straight line?

- (c) Find out the x-intercept and y-intercept of this line.
- (d) Is this line perpendicular to the line y = x + 1? Explain your answer.
- (e) Is this line parallel to the line y = 2x + 1? Explain your answer.



(b) For what value of k will the three points (1,5), (2,7) and (3,k) be on the same line?

4. (a) Solve the following system of linear equations using Gaussian elimination method:

$$\begin{cases} x + 2y = 3 \\ 2x + y = 4 \end{cases}$$

(b) Give an example that a system of linear equation has no solutions at all.

5. Perform the following matrix multiplication

$$\left[\begin{array}{ccc} 3 & 2 & 4 \end{array}\right] \cdot \left[\begin{array}{c} -3 \\ -1 \\ -9 \end{array}\right]$$

$$\left[\begin{array}{ccc} 3 & 2 & -1 \\ 1 & 0 & -1 \end{array}\right] \cdot \left[\begin{array}{ccc} 0 & -3 \\ 2 & -1 \\ 3 & -5 \end{array}\right]$$