I. The Rectangular Coordinate System:

1. The rectangular coordinate system is formed by the horizontal line called **x-axis** and the vertical line called **y-axis**.

2. **Origin:** the intersection of x-axis and y-axis.

3. **Quadrant:** four regions which are created by x-axis and y-axis.

4. **Ordered pair (x, y):** representation of a point on the rectangular coordinate system.

Example 1: Plot each point and state the quadrant or axis where it is located.
a. (4, 1)   b. (-3,4)   c. (-4,0)   d. (0, 3)

II. Linear Equations in Two Variables:

1. Linear equation in two variables is an equation that can be written in the form

$$\mathbf{Ax+By=C} \ \text{(This is called the } \textit{standard form})$$

(x,y): is a solution of a linear equation in two variable if it makes the equation a true statement.

Example 2: For the linear equation: $-2x+3y = 8$. Determine whether the ordered pair is a solution.
a. (-4, 0)   b (2, -4)

2. The **graph** of an equation in two variables: is a line passing through all ordered pair solutions to the equation. We need **2 point** to graph a line.

   Example 3: *Graphing a Linear Equation in Two Variables:*

   Graph the equation: $3x + 5y = 15$

   Your Turn:
   Graph the equation: $2x - y = 1$

3. **x-intercept and y-intercept:**

   a. *x-intercept:* (a, 0) , where a graph intersects the x-axis. To find x-intercept, let $y = 0$ and solve for x.

   b. *y-intercept:* (0, b) , where a graph intersects the y-axis. To find y-intercept, let $x = 0$ and solve for y.

   Example 4: *Finding x- and y-intercept of a line:*

   Given $2x + 4y = 8$, find x- and y-intercepts, then graph the equation.

   Your Turn:
   Given $-2x + y = -4$, find x- and y-intercepts, then graph the equation.

4. **Horizontal and Vertical Lines:**

   a. A *horizontal line:* x = k, an equation can be written in this form where k is a constant.

   b. A *vertical line:* y = k, an equation can be written in this form where k is a constant.

   Example 5: *Graphing a vertical/horizontal line:*

   Graph the equation $x = 6$

   Your Turn:
   Graph the equation $2y = -6$