LESSON 3: EQUATIONS OF LINES

Objectives:
1. To define the slope of a line
2. To know the various forms of equations of lines
3. To find the slope of a line perpendicular to a given line

Slope of a Line

$$\text{Slope = m = rise} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Parallel Lines $m_1 = m_2$

Perpendicular Lines $m_1 \bullet m_2 = -1$

Equations of Lines

General ..... $Ax + By + C = 0$

Slope-intercept..... $y = mx + b$

Point-slope ..... $y - y_1 = m\left(x - x_1\right)$

Modified Point-slope ..... $y = m\left(x - x_1\right) + y_1$

Horizontal ..... $y = b$

Vertical..... $x = a$

Intercept Form ..... $\frac{x}{a} + \frac{y}{b} = 1$, **for** x**-int =** a **and** y**-int =** b

Problems

1. Find the equation of the line that passes through the point (-2, -3) and is perpendicular to the line given by $2x - 4y = 5$.

2. Find the equation of the line that passes through points (-2, 5) and (-2, -11).

3. Find the equation of the circle through the points A(4, 3), B(-2, -5), and C(5, 2).