Linear Equations in Two Variables

Slope: $\frac{Rise}{Run} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

Slope Intercept Form of a Line: $y = mx + b$

Point-Slope Form of a Line: $y - y_1 = m(x - x_1)$

Standard form of a Line: $Ax + By + C = 0$

When we obtain a slope equal to zero, what kind of line do we have? What does the equation of the line look like?

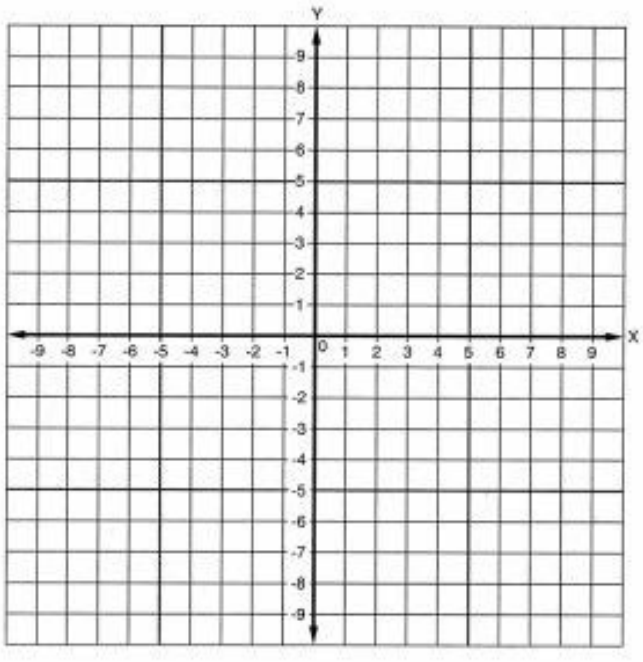
When we obtain an undefined slope, what kind of line do we have? What does the equation of the line look like?

Parallel lines?

Perpendicular Lines?

EX: Sketch the graph of the linear equations:

- $y = -2x + 1$
- $y = 3$
- $x - y = 4$



EX: Find the slope of the line passing through the points and the equation of the line:

- (-5, -6) and (2, 8)

- (0, 0) and (0, -6)

- (0, -1) and (3, -1)

EX: Find the slope-intercept form of the equation of the line that has the given slope and passes through the given point.

- $m = 2, (3, -7)$

- $m = -\frac{2}{3}, (1,1)$

EX: Find the slope-intercept form of the equations of the lines that pass through the point $(-4,1)$ and are (a) parallel to and (b) perpendicular to the line $5x - 3y = 8$.

EX: A manufacturing firm purchases a machine worth $24,750. The machine has a useful life of 6 years. After 6 years, the machine will have to be discarded and replaced, because it will have no salvage value. Write a linear equation that describes the book value of the machine each year.