Chapter 4

Writing Linear Equations

Slope

- 1. To find slope:
  - Use formula $\frac{y_2 - y_1}{x_2 - x_1}$ OR…….
  - With a graph: count $\frac{rise}{run}$

4.1-4.3 Writing Linear Equations

- A line comes in an equation that has an *x* and a *y*
- Every line has a slope (m)
- Line can be written in 2 Forms
  - Depends on what you know

To Write Equation of Line

- 1. FORM

SLOPE – INTERCEPT FORM: $y = mx + b$

If you know the slope and y –intercept

– Plug in for *m* and *b*

- 2. FORM

POINT – SLOPE FORM: $y - y_1 = m(x - x_1)$

If you know a point and the slope

Plug in *x* and *y* and *m*

To Graph

- Plot one point: (x,y)
- Use slope to get 2nd point: m

- KNOW YOUR FORMS
- READ DIRECTIONS for what form to answer in

4.4 Standard Form

- Know 3 Forms:
  - Slope-Intercept: y=mx + b ex: y = 3x + 2
  - Point-Slope: $y - y_1 = m(x - x_1)$ ex: y – 3=5(x-2)
  - Standard: Ax + By = C ex: 3x + 4y = 6

- Standard tells us nothing
  - To put in Standard Form get rid of parenthesis
  - Move x

Horizontal and Vertical Lines

- Horizontal Lines: 
  - Goes through y-axis so equation is $y = b$

- Vertical lines:  Goes through x-axis so equation is $x = a$

- (2,3) Horizontal Line: $y = 3$
- Vertical Line: $x = 2$

4.5 Parallel and Perpendicular Lines

- If 2 lines are Parallel, then $m_1 = m_2$
- If 2 lines are Perpendicular($\perp$), then $m_1 = \frac{-1}{m_2}$
- To write equation: find slope, use point-slope
  - Use: $y - y_1 = m(x - x_1)$ OR $y = mx + b$

- **Equivalent Equations**:
  - Equations that look different but are equal
  - Make by: multiplying or dividing entire equation

  - Ex: $x + 3y = 6$
  - $2x + 6y = 12$
  - $3x + 9y = 18$

4.6 Scatter Plots

- A graph of (x,y)
- Shows a relationship
- Positive Correlation, Negative Correlation, None

- To Write equation:
  - draw a line between points, connect 2
  - Find slope, use $y - y_1 = m(x - x_1)$