Slope

- The **change in y (rise)** <u>divided</u> by the **change in x (run)**.

$$slope = \frac{\Delta y}{\Delta x} = \frac{rise}{run}$$

- Also called **the average rate of change**.

Standard Equations for a Line

- **y = mx + b**, where m = **slope** and b = the **y-intercept**

- **$y - y_1 = m(x - x_1)$** for situations where you're **given the slope and a point (x_1, y_1)**

Function Substitution (into a line equation)

- If a coordinate (s, t) lies on a line y = mx + b, then substitute t for y and s for x: **t** = m(**s**) + b.
- If you substitute a coordinate and the equation is no longer =, then the coordinate is <u>not</u> on the line.
- Examples:
  - Does (1, 2) lie on the line with equation y = 3x – 1?
  - Does (–1, 2) lie on the line with equation y = 3x + 1?
  - Does (2, 5) lie on the line with equation y = 2x + 1?

Line Problems

- Find the equation of a line given the slope and the y-intercept.
  - Slope = 3, y-intercept = (0, –1)
- Find the equation of a line given the slope and one coordinate.
  - Slope = –1, coordinate = (2, 5)?
- Find the equation of a line given the x-intercept and y-intercept.
  - x-intercept = (2, 0), y-intercept = (0,5)?
- Find the equation of a line given two points.
  - Coordinates = (1, 3) and (–2, –1)
- Find the slope and y-intercept of a line given the equation of the line in standard form Ax + By + C = 0.
  - 3x + 2y – 2 = 0?