Vocabulary: Trends in Scatter Plots

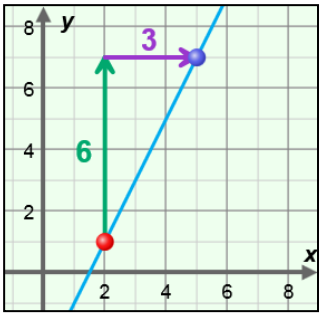
Vocabulary

- Correlation – a measure of the relationship between two variables.
  - If the variables vary together (as one goes up, the other tends to go up), they are *positively correlated*.
  - If the variables vary in opposite directions (as one goes up, the other tends to go down), they are *negatively correlated*.
  - If the variables are unrelated, they have *no correlation*.
- Scatter plot – a graph of (x, y) points that shows the general relationship between two variables, x and y.
  - Generally, the variable on the horizontal (x) axis is the *independent variable*, and the variable on the vertical (y) axis is the *dependent variable*.
- Slope – a measure of the steepness of a line.
  - For two points on a line, (x_1, y_1) and (x_2, y_2), slope is defined as:

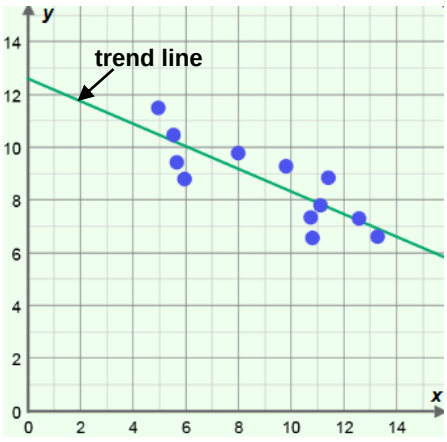
$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}.$$

  - For example, the slope of the line through the points (2, 1) and (5, 7) as shown to the right is:

$$\frac{7-1}{5-2} = \frac{6}{3} = 2.$$



- Trend line – a line that fits the points in a scatter plot well.
  - The slope of the trend line indicates the type of correlation the variables have.
    - A positive slope indicates a positive correlation, a negative slope indicates a negative correlation, and a slope of zero indicates no correlation.
    - For example, the trend line shown to the right suggests a negative correlation between the variables.



- y-intercept – the y-coordinate where a graph intersects the y-axis.
  - In the equation $y = mx + b$, b is the y-intercept.