

Slope Intercept Activity

Overview

The **slope** of a line is the measure of the line's steepness. If (x_1, y_1) and (x_2, y_2) are any two points on the line, the slope of the line, known as m , is represented by the equation

$$m = \frac{y_2 - y_1}{x_2 - x_1}.$$

The **y-intercept** of a line is the point at which the line crosses the y -axis, given by the coordinates $(0, b)$. The **slope-intercept form** for the equation of a line is

$$y = mx + b,$$

where m is the slope and b is the y -intercept.

Using the Slope Intercept VI, students will explore the transformations that occur when the slope and y -intercepts are adjusted. The VI graphs the line that is formed using the slope and y -intercept, and also calculates the equation for the new line.

Objectives

Students will deepen their understanding of:

- The slope of a line.
- The y -intercept of a line.
- The slope-intercept equation for a line.
- Transforming the parent function for a line.

Standards (TEKS)

Algebra 1: A.1, A.2, A.6

Geometry: G7

Algebra 2: 2A.4

IPC: c.4

Chemistry: c.2

Physics: c.2

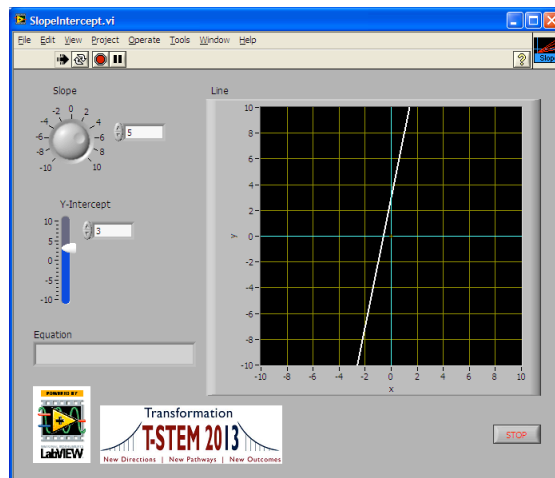
Activity

- 1) Open and run the VI.
- 2) This VI uses $y = 1x + 0$ (the parent function) as its default input. The graph of $y = x$ is displayed.

The **slope** of the line is set to 1 and can be changed by typing a new value into the input box, or by adjusting the dial using your mouse. The **y-intercept** of the line is set to 0 and can be changed by typing a new value into the input box or by adjusting the slide using your mouse. As each adjustment is made, take note of the new equation and the new graph that results from each transformation.

3) Let's practice:

- a) Adjust the slope to 5. How was the parent function transformed?
- b) Adjust the y-intercept to 3. What happened?
- c) What is the resulting equation?
- d) How does the new graph differ from the original graph?



4) More practice:

- a) Adjust the slope to -0.75 . What happened? Describe the graph of the new line.
- b) Adjust the y-intercept to -3 . What happened?
- c) What is the resulting equation?
- d) Describe the new graph compared to the parent function.

5) In your own words, write some heuristics (rules) for the changes that occur when the slope of a line is altered. (Hint: focus on both integers and decimal/fractional values.)

6) In your own words, write some heuristics (rules) for the changes that occur to the parent function when the y-intercept of the equation is altered.

7) Describe what the coefficient of x represents in any of the resulting functions. Describe what the constant represents in any of the resulting functions.