



WEEK 6: ALGEBRA - FUNCTIONS

Modifying the Slope and Y-intercept

A linear function (a function that graphs as a line) can be written in the form $f(x) = mx + b$, where m and b are real numbers. If x is fixed, what happens to the value of $f(x)$ if m increases by one? if m decreases by two? if m changes by n ? If x is fixed, what happens to the value of $f(x)$ if b increases by one? if b decreases by two? if b changes by n ?

GPS	As seen in Problem Exploration
M6A2: Students will consider relations between varying quantities. a. Analyze and describe patterns arising from function rules, tables, and graphs.	By exploring this linear function, the student is exploring the relationship between two quantities. This can be done by analyzing a graph of linear functions.
M7A2: Students will understand and apply linear equations with one variable. d. Solve two-step linear equations with one variable.	Exploring linear functions that are in the form of $y=mx+b$ is a two-step process.
M7A3: Students will understand relations and functions. b. Represent, describe and analyze a functional relation from a table, graph, and/or formula.	By graphing and evaluating the linear equations, students will be representing, describing and analyzing functional relations from graphs.
M8A2: Students will understand linear relations and functions. b. Translate among verbal, tabular, graphic, and algebraic representations of functions.	The student must be able to translate between the algebraic representation of the functions (equation) and their graphs.
M8A3: Students will graph and analyze graphs of linear equations. b. Graph equations of the form $y = mx + b$. e. Interpret the meaning of the slope and y-intercept in a given situation.	Linear equations are being graphed and analyzed in this investigation. They are all written in the form of $y=mx+b$. The analysis in this investigation involves seeing what happens to a graph when the slope and y-intercept are changed. <input type="checkbox"/>



Triangle from a Line

The line $Ax + By = C$ will form a triangle with the x and y-axis for what values of A, B, and C?

GPS	As seen in Problem Exploration
<p>M7N1: Students will understand the meaning of positive and negative numbers including rational numbers and will compute with them. c. Add, subtract, multiply and divide positive and negative rational numbers.</p>	<p>A, B, and C can be negative values as well as rational and graphing these equations requires an understanding of these concepts.</p>
<p>M7A3: Students will understand relations and functions. b. Represent, describe and analyze a functional relation from a table, graph, and/or formula.</p>	<p>$Ax + By = C$ represents a linear function. <input type="checkbox"/> By graphing and evaluating the equation, students will work with linear equations. <input type="checkbox"/> Vertical and horizontal lines may also be discussed in terms of functions and relations.</p>
<p>M8A2: Students will understand linear relations and functions. b. Translate among verbal, tabular, graphic, and algebraic representations of functions.</p>	<p>The student must be able to translate between the algebraic representation of the functions (equation) and their graphs.</p>
<p>M8A3: Students will graph and analyze graphs of linear equations. c. Graph equations of the form $Ax + By = C$. e. Interpret the meaning of the slope and y-intercept in a given situation. <input type="checkbox"/></p>	<p>c. <input type="checkbox"/> Students must graphically represent equations in the form $Ax + By = C$ and analyze whether or not the graph forms a triangle between the x and y axis. e. <input type="checkbox"/> The concept of intercept is essential for the discussion in order to create a triangle with the x- and y-axis, the intercepts must be something other than zero.</p>