

Properties of Representations of Linear Functions (8G)

Topic: Linear Functions

Learning goals

- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line

Sim

[Function Builder simulation](#)

Explore

1. Play with Function Builder.
2. Show the equation and table tabs on the function machine. Try out different functions of the form $y = mx + b$.

Part 1: Table and Equation

Generate cases

For three functions, put at least five numbers through the function machine. Look for patterns in the table of each function.

Function:

x	y

Function:

x	y

Function:

x	y

Conjecture

What is true about the relationship between the equation and the table of a function of the form $y = mx + b$? You can make more than one conjecture!

Justify one conjecture

First, is it true for other functions of the form $y = mx + b$ that you hadn't tried yet? Try two more. (Pick "weird" examples that you think might break the pattern.)

Next, is it true for ANY function of the form $y = mx + b$? Use what you know about numbers and algebra to explain why or why not.

Part 2: Graph and Equation

Generate cases

Show the graph tab. Try out more functions of the form $y = mx + b$. Look for patterns that relate the table, the equation and the graph.

Conjecture

What is always true about the relationship between the equation and the graph?

Justify

First, is it true for two more examples? (pick “weird” examples that you think might break the pattern)

Next, is it true for any table and graph that can be made from functions of the form $y = mx + b$? Use conjectures you have already decided are true to help you justify this as true or false.

Part 3: Table and Graph

Conjecture

What is always true about the relationship between the table and the graph? (use cases already made)

Justify

First, does the pattern work for two more examples? (pick “weird” examples that you think might break the pattern).

Next, does the pattern work for *any* table and graph that can be made from functions of the form $y = mx + b$? *Use conjectures you have already decided are true to help you justify this.*