Lesson 10: Interpreting Linear Functions

Instruction

Georgia Standards of Excellence

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Essential Questions

1. How can maximum and minimum values of a function be applied to a real-world context?
2. What is the purpose of using the rate of change to analyze real-world data?
3. For what types of real-world data can you find the rate of change?

WORDS TO KNOW

continuous	having no breaks
domain	the set of all input values for which a relation or function is defined; the set of *x*-values that are valid for a relation or function
integer	the set of positive and negative whole numbers and 0; the set {... –3, –2, –1, 0, 1, 2, 3, ...}
intercept	the value of the *x*- or *y*-coordinate where a line or curve intersects the *x*- or *y*-axis, respectively
interval	the continuous set of real numbers between two given numbers
irrational number	a real number that cannot be written as $\frac{m}{n}$, where m and n are integers and $n \neq 0$; a non-terminating or non-repeating decimal
natural numbers	the set of positive integers {1, 2, 3, ...}
negative function	a function or a portion of a function where the *y*-values are less than 0 for all *x*-values
positive function	a function or a portion of a function where the *y*-values are greater than 0 for all *x*-values

Instruction

rate of change	a ratio that describes how much one quantity changes with respect to the change in another quantity; also known as the slope of a line
ratio	the relation between two quantities; can be expressed in words, or as a fraction, decimal, or percent
rational number	a real number that can be written as $\frac{m}{n}$, where m and n are integers and $n \neq 0$; a terminating or repeating decimal
real numbers	the set of all rational and irrational numbers
relative maximum	the greatest value of a function for a particular interval of the function
relative minimum	the least value of a function for a particular interval of the function
slope	the measure of the rate of change of one variable with respect to another variable; slope $= m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}}$
slope-intercept form of a linear equation	the form $y = mx + b$, where m is the slope of the line and b is the y-intercept
undefined slope	occurs when the denominator of the slope formula is equal to 0; the corresponding line is a vertical line
whole numbers	the set of positive integers and 0: {0, 1, 2, 3, ...}
***x*-intercept**	the x-coordinate of the point where a line or a curve intersects the x-axis
***y*-intercept**	the y-coordinate of the point where a line or a curve intersects the y-axis

Instruction

Recommended Resources

- Illuminations. "Changing Cost per Minute."

  http://walch.com/rr/CAU3L3ChangingCost

  This interactive applet of cell phone charges allows users to view how changing the graph of the cost per minute affects the graph of the total cost. *Note*: Requires Java.

- Illuminations. "Constant Cost per Minute."

  http://walch.com/rr/CAU3L3ConstantCost

  This interactive applet of cell phone charges allows users to view how the total cost of service changes when a constant cost per minute is manipulated. *Note*: Requires Java.