Algebra Concepts and Connections Unit 6: Analyzing Exponential Functions

Overview:

In this unit, students will construct and analyze the graph of an exponential function to explain a contextual situation for which the graph serves as a model; compare exponential with linear and quadratic functions.

Learning Targets:

In Unit 6, students will:

- Build and evaluate exponential functions represented using function notation
- Evaluate exponential functions for inputs in their domains in function notation
- Interpret domains given a function numerically, algebraically, and graphically
- Graph simple exponential functions by hand and with technology
- Identify and analyze the key characteristics including domain, range, intercepts, average rate of change, intervals, increasing, decreasing, positive, negative, relative maximums, relative minimums, asymptotes, and end behavior of simple exponential functions
- Express characteristics in interval notation and set-builder notation
- Estimate the rate of change from a graph of an exponential function
- Explain how rate of change in linear functions differs from rate of change in exponential functions
- Identify the effect on an exponential function graph when f(x) is replaced with f(x) + k
- Identify the effect on an exponential function graph when f(x) is replaced with f(x + k)
- Identify the effect on an exponential function graph when f(x) is replaced with k f(x)
- Find the value of k given exponential graphs
- Build geometric sequences as functions
- Interpret geometric sequences as functions
- Convert geometric sequences between the different forms
- Compare geometric and arithmetic sequences
- Compare characteristics of two exponential functions represented in different ways
- Compare graphs and tables of values of exponential functions to quadratic and linear functions

Key Vocabulary: (linked to GA DOE Interactive Glossary)

Arithmetic Sequence	Domain	Function Notation	Interval of Decrease	Recursive Relationships	Vertical Translation
Asymptote/Asymptotic Behavior	End Behavior	Graph	Infinity	Simple Interest	Zero
Base	Exponent	Half-life	Negative Infinity	Stretch	
Characteristics of a Graph	Exponential	Horizontal Translation	Parent Function	Strictly Decreasing	
Compound Interest	Exponential Decay	Intercept	Positive Infinity	Strictly Increasing	
Compression	Exponential Growth	Interval of Increase	Range	Transformations	

Supporting Resources:

http://ctlslearn.cobbk12.org/

GA Virtual - Analyzing Exponential Functions

Exponential Function Reference

Intro to geometric sequences

Compound Interest