

# Exponential and Logarithmic Functions

Content Area: **Math**  
Course(s): **Accelerated Algebra II, CP Algebra II**  
Time Period: **Marking Period 3**  
Length: **6**  
Status: **Published**

## Unit Overview

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This unit allows students to master rules exponential and logarithmic functions.

## Enduring Understandings

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Construct and compare linear and exponential models and solve problems.

Analyze functions using different representations.

Build new functions from existing functions.

Build a function that models a relationship between two quantities.

Interpret the structure of expressions.

Create equations that describe numbers or relationships.

Rewrite rational expressions

Represent and solve equations and inequalities graphically.

## Essential Questions

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How do you model a quantity that changes regularly over time by the same percentage?

How are exponents and logarithms related?

How are exponential functions and logarithmic functions related?

## New Jersey Student Learning Standards (No CCS)

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MA.A-SSE.A.1b

Interpret complicated expressions by viewing one or more of their parts as a single entity.

MA.F-IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
MA.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
MA.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
MA.F-BF.A.1	Write a function that describes a relationship between two quantities.
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
MA.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
MA.F-BF.B.4a	Solve an equation of the form $f(x) = c$ for a simple function $f$ that has an inverse and write an expression for the inverse.
MA.F-LE.A.4	Understand the inverse relationship between exponents and logarithms. For exponential models, express as a logarithm the solution to $ab$ to the $ct$ power $= d$ where $a$ , $c$ , and $d$ are numbers and the base $b$ is 2, 10, or $e$ ; evaluate the logarithm using technology.
MA.A-REI.D.11	Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

## Interdisciplinary Connections

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LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

## Technology Standards

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TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

## 21st Century Themes/Careers

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CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
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## Financial Literacy Integration

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PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.

## Instructional Strategies & Learning Activities

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- Use graphing calculator to explore tables.
- Spend time with modeling activities.
- Spend at least one day dedicated to modeling problems
- Use problems and activities from book involving modeling problems
- ~~Provide access to online book~~
- Provide access to book pages and problems through Canvas and Twitter
- Provide access to review keys
- ~~Assign ExamView Questions to provide practice and assessment.~~
- Use Delta Math for practice and assessments.

## Formative Assessments

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- Daily homework checks
- ~~ExamView Questions~~
- Delta Math assignments
- Chapter Unit Test
- Exit Tickets
- Warm-ups
- Quizzes

## Summative Assessment

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- Unit Test

## Benchmark Assessments

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## Resources & Technology

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- google docs, spreadsheets, slides
- TI graphing calculator
- document camera
- Chromebooks
- websites: desmos, Examview, EdPuzzle
- ~~Canvas quizzes~~
- Delta Math
- Teacher Created YouTube Videos
- Promethean Board