

# Rational Functions

Content Area: **Math**  
Course(s): **Accelerated Algebra II, CP Algebra II**  
Time Period: **Marking Period 4**  
Length: **4**  
Status: **Published**

## Unit Overview

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This unit allows students to master simplifying rational expressions and solve rational equations.

## 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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Are a rational expression and its simplified form equivalent?

## New Jersey Student Learning Standards (No CCS)

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MA.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
MA.A-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
MA.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$

as  $(x^2)^2 - (y^2)^2$ , thus recognizing it as a difference of squares that can be factored as  $(x^2 - y^2)(x^2 + y^2)$ .

MA.A-APR.D.6

Rewrite simple rational expressions in different forms; write  $a(x)/b(x)$  in the form  $q(x) + r(x)/b(x)$ , where  $a(x)$ ,  $b(x)$ ,  $q(x)$ , and  $r(x)$  are polynomials with the degree of  $r(x)$  less than the degree of  $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.

MA.A-APR.D.7

Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

MA.A-CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

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.

## 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.

## 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
- Unit Test
- Exit Tickets
- Warm-ups
- Quizzes
- Delta Math assignments
- ~~HW Quizzes through Canvas~~

## Summative Assessment

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- Unit Quiz

## Benchmark Assessments

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- Final Exam

## Resources & Technology

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- google docs, spreadsheets, slides
- TI graphing calculator
- document camera
- chromebooks
- websites: Desmos, Examview, EdPuzzle
- Canvas
- Teacher Created YouTube Videos
- Delta Math