

Rational Expressions

Students who study rational expressions are learning to answer the questions

What role does factoring play in manipulating rational expressions?

Why is the domain an important consideration in simplifying rational expressions?

What happens to the value of a rational expression as the variable increases or decreases?

This unit of study is a preview of second-year algebra; it addresses Indiana College & Career Ready Standards as follows:

AII.CNE.3: 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 algebraic rational expressions.

AII.CNE.4: Rewrite algebraic rational expressions in equivalent forms (e.g., using laws of exponents and factoring techniques).

AII.CNE.5: Rewrite 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 long division and synthetic division.

AII.PR.3: Solve real-world and other mathematical problems involving rational and radical equations, including direct, inverse, and joint variation. Give examples showing how extraneous solutions may arise.

Gaining skills in this unit will enable students to do everyday tasks like splitting a job with a coworker, making a travel schedule, or tuning a musical instrument. The specific skills in this unit of study include

- solving algebraic proportions
- simplifying rational expressions
- multiplying and dividing rational expressions
- performing polynomial division
- adding and subtracting rational expressions
- simplifying complex expressions
- solving rational equations