Algebra 2 Level 2 - Unit 5 - Rational Expressions and Functions

Unit Focus

Students will perform operations on rational expressions: simplifying, adding, subtracting, multiplying and dividing. They will also solve rational equations. They will be able to graph rational functions by finding the vertical and horizontal asymptotes, intercepts, and testing points.

Stage 1: Desired Results - Key Understandings

Standard(s)

Common Core
Mathematics: 9-12

- 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. (CCSS.MATH.CONTENT.HSA.APR.D.6)
- Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. (CCSS.MATH.CONTENT.HSA.REI.A.2)
- Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1)
- Model with mathematics. (CCSS.MATH.MP.4)
- Use appropriate tools strategically. (CCSS.MATH.MP.5)
- Attend to precision. (CCSS.MATH.MP.6)

Madison Public Schools Profile of a Graduate

- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)

Transfer

Students will be able to independently use their learning to...
T1 model relationships among quantities.
T2 manipulate equations/expressions or objects to create order and establish relationships.
T3 draw conclusions about graphs, shapes, equations, or objects.
T4 work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective.

Meaning

Understanding(s)

Students will understand that...
U1 Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions.
U2 Mathematicians examine the impact of operations and how they relate to one another.
U3 a graph can be used to get a broad understanding of a function.

Essential Question(s)

Students will keep considering...
Q1 What math tools/models/ strategies can I use to solve the problem?
Q2 How can I simplify the problem?
Q3 What does the graph tell me?

Acquisition of Knowledge and Skill

Knowledge

Students will know...
K1 The difference between a rational expression and a rational equation and simplifying, versus solving.
K2 Vocabulary: asymptote

Skill(s)

Students will be skilled at...
S1 finding the restrictions on the domain
S2 graphing (sketch) rational functions, including x and y intercepts and vertical and horizontal asymptotes and slant asymptotes (time permitting)
S3 manipulating rational expressions(add/ subtract/multiply/divide)
S4 solving rational equations