Core Content

Cluster Title: Analyze functions using different representations.
Standard F.IF.7d(H): Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for complicated cases.*   d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available and showing end behavior.
Concepts and Skills to Master
- Identify end behaviors (horizontal asymptotes, oblique [or other] asymptotes).   - Understand vertical asymptotes.   - Understand turning points.   - Understand critical points (intercepts).

Supports for Teachers

Critical Background Knowledge	
- All of Secondary Math II - Dividing polynomials - Asymptotes (F.LE.2 – Secondary Math I) - Rewriting rational expressions (A.APR.6 – Secondary Math II) - Expanding polynomials	
Academic Vocabulary	
asymptote, end behavior, critical points	
Suggested Instructional Strategies	**Resources**
- Graph a variety of rational expressions using a graphing utility. - Sort a variety of graphs and equations of rational functions using Venn diagrams.	
Sample Formative Assessment Tasks	
Skill-Based Task: Analyze the graph of $R(x) = \dfrac{2x+4}{x^2-4}$.	**Problem Task:** A manufacturing company makes aluminum cans in the shape of a cylinder with a capacity of 500 cubic centimeters. Write and graph an equation for the amount of material required for one can as a function of the radius. What does the graph represent? Where is the minimum value and what does it represent? (Sullivan, *College Algebra*, p. 364)

III.4.F.IF.7d (H)