

Core Content

Cluster Title: Analyze functions using different representations.
Standard F.IF.7: Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
c) Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Concepts and Skills to Master
<ul style="list-style-type: none"> Graph simple polynomial functions by hand and identify key features of the graph. Graph complex polynomial functions using technology and identify key features of the graph. Identify the domain and range of a polynomial function.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> Graphing linear, quadratic, square root, cube root, and piecewise-defined functions (I, II.F.IF.7) 	
Academic Vocabulary	
polynomial, root, zero, solution, extrema, minimum, maximum, end behavior, domain, range	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> Build on knowledge of graphing obtained in previous courses. Use technology to illustrate key features and explore behavior of polynomial functions. 	
Sample Formative Assessment Tasks	
<p>Skill-Based Task: Graph the function : $f(x) = 4x^4 - 8x^3 - 19x^2 + 23x - 6$ Provide an appropriate viewing window where key features are visible. Identify the extrema, domain, and range. Determine the intervals over which the function is increasing or decreasing. Approximate the value of the roots, and give the multiplicity of each. Describe the end behavior.</p>	<p>Problem Task: Given a sheet of construction paper that measures 45.7 cm by 30.5 cm, cut a square measuring x by x from each of the corners to produce a topless box. Model the volume of the box with a polynomial equation. What's the practical domain of your volume function? Explain why a value of $x = 25$ cm is not a possible solution even though it provides a positive volume. Identify the value of x that will provide a maximum volume. What is that volume?</p>