

Curriculum Units and Learning Outcomes

Content Area: 2-3 weeks	Grade Level: 11 - 12
Unit 6: Advanced Functions	
<p>Unit Summary: This unit will focus on performing operations on functions, composing functions, and finding their inverses. The importance of understanding the domain and range of a function is emphasized. When graphed, function end behavior, increasing / decreasing intervals, positive / negative intervals, and relative extrema are analyzed.</p>	
<p>Massachusetts Standards:</p> <ul style="list-style-type: none"> ● PC.F-BF <ul style="list-style-type: none"> A. Build a function that models a relationship between two quantities. <ul style="list-style-type: none"> ○ Write a function that describes a relationship between two quantities. ○ (+) Compose functions. B. Build new functions from existing functions. <ul style="list-style-type: none"> ○ Find inverse functions. ○ (+) Verify by composition that one function is the inverse of another. ○ (+) Read values of an inverse function from a graph or a table, given that the function has an inverse. ○ (+) Produce an invertible function from a non-invertible function by restricting the domain. ○ (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. 	
<p>Enduring Understandings:</p> <ul style="list-style-type: none"> ● Domain and range are important in the understanding of the behavior of functions. They also help in finding and understanding the validity of solutions. ● Not all inverses of functions are themselves functions ● Compositions of functions are created by substitutions of one function into another 	
<p>Essential Questions:</p> <ul style="list-style-type: none"> ● Why is finding the domain and range of a function important? ● How are the properties of functions and functional operations useful? ● How do I analyze graphs with a lens towards Calculus? ● How can real world applications be modeled using composite functions? 	

- How do I perform operations on functions?

Students will demonstrate KNOWLEDGE of:

- Understanding domain / range, relative extrema and end behavior of the graphs of all functions.
- Inverses and compositions of functions.
- limits of a function are the value that a function approaches but doesn't necessarily reach
- Piecewise functions

Students will be SKILLED at:

- Analyzing graphs of functions by examining the end behavior, relative extrema, increasing / decreasing intervals, positive / negative intervals
- Finding domain and range of functions graphically and algebraically
- Writing and graphing piecewise functions with linear and nonlinear functions.
- Find inverses of functions and stating the domain and range.
- Determining if inverses of functions are themselves functions
- Composing and evaluating functions
- Performing operations on functions

Estimated Duration: 2-3 weeks