

Exponential and Logarithmic Functions

Instructional Focus: Graph and interpret exponential and logarithmic functions

	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Identify and Find Transformations (F.BF.3)	<p>Can extend thinking beyond the standard, including tasks that may involve one of the following:</p> <ul style="list-style-type: none"> Designing Connecting Synthesizing Applying Justifying Critiquing 	<p>Identify the effect on a graph by replacing $f(x)$ with <u>more than two transformations</u>: $f(x) + k$, $k f(x)$, $f(kx)$, $f(x + k)$ for specific positive and negative values of k</p> <p>Given the graph of a function and <u>more than two transformations</u>, find the values of the constants and coefficients</p>	<p>Identify the effect on a graph by replacing $f(x)$ with <u>two transformations</u>: $f(x) + k$, $k f(x)$, $f(kx)$, $f(x + k)$ for specific positive and negative values of k</p> <p>Given the graph of a function and <u>two transformations</u>, find the values of the constants and coefficients</p>	<p>Identify the effect on a graph by replacing $f(x)$ with a <u>single transformation</u>: $f(x) + k$, $k f(x)$, $f(kx)$, $f(x + k)$ for specific positive and negative values of k</p> <p>Given the graph of a function and a <u>single transformation</u>, find the value of the constant or coefficient</p>	<p>Little evidence of reasoning or application to solve the problem</p> <p>Does not meet the criteria in a level 1</p>
Identify key features of graphs (F.IF.7)	<ul style="list-style-type: none"> Analyzing Creating Proving 	<p>Graph exponential and logarithmic functions, and interpret all related key features of a graph <u>in context of a real world situation</u>.</p> <ul style="list-style-type: none"> equations of asymptotes intercepts (x and y) end behavior 	<p><u>Graph</u> exponential and logarithmic functions, and identify all related key features of a graph.</p> <ul style="list-style-type: none"> equations of asymptotes intercepts (x and y) end behavior 	<p><u>Given the graphs of</u> exponential and logarithmic functions, and identify all related key features of a graph.</p> <ul style="list-style-type: none"> equations of asymptotes intercepts (x and y) end behavior 	

F.BF.3 (+) Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. ~~Experiment with cases and illustrate an explanation of the effects on the graph using technology.~~ *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*

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. ★

d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

e. (+) Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

Exponential and Logarithmic Functions

Instructional Focus: Use inverse relationships to solve exponential and logarithmic problems

	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Exponential and Logarithmic inverses (F.BF.5)	<p>Can extend thinking beyond the standard, including tasks that may involve one of the following:</p> <ul style="list-style-type: none"> • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving 	Recognize that exponential and logarithmic functions are inverses of each other and use these functions to solve <u>real-world problems</u> .	Recognize that exponential and logarithmic functions are inverses of each other <u>and use these functions to solve logarithmic and exponential equations</u> .	Recognize that exponential and logarithmic functions are inverses of each other and convert from one form into the other.	<p>Little evidence of reasoning or application to solve the problem</p> <p>Does not meet the criteria in a level 1</p>

F.BF.5 (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.