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	Can extend	Identify the effect on a	Identify the effect on a	Identify the effect on a	Little
and Find	thinking beyond	graph by replacing f(x) with	graph by replacing f(x) with	graph by replacing f(x) with	evidence
Transfor-	the standard,	more than two	two transformations:	a single transformation:	of
mations	including tasks	transformations:	f(x) + k, k f(x),	f(x) + k, k f(x),	reasoning
(F.BF.3)	that may involve	f(x) + k, k f(x),	f(kx), $f(x + k)$ for specific	f(kx), $f(x + k)$ for specific	or
	one of the	f(kx), $f(x + k)$ for specific	positive and negative values	positive and negative values	application
	following:	positive and negative values	of k	of k	to solve
		of k			the
	 Designing 		Given the graph of a	Given the graph of a	problem
	Connecting	Given the graph of a	function and two	function and a single	
	Synthesizing	function and more than two	transformations, find the	transformation, find the	Does not
	Applying	transformations, find the	values of the constants and	value of the constant or	meet the
	 Justifying 	values of the constants and	coefficients	coefficient	criteria in
	Critiquing	coefficients			a level 1
Identify key	 Analyzing 	Graph exponential and	Graph exponential and	Given the graphs of	
features of	 Creating 	logarithmic functions, and	logarithmic functions, and	exponential and logarithmic	
graphs	Proving	interpret all related key	identify all related key	functions, and identify all	
(F.IF.7)	_	features of a graph <u>in</u>	features of a graph.	related key features of a	
		context of a real world	 equations of 	graph.	
		<u>situation</u> .	asymptotes	 equations of 	
		 equations of 	• intercepts (x and y)	asymptotes	
		asymptotes	end behavior	intercepts (x and y)	
		intercepts (x and y)		end behavior	
		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	Can extend	Recognize that exponential	Recognize that exponential	Recognize that exponential	Little
and	thinking beyond	and logarithmic functions	and logarithmic functions	and logarithmic functions	evidence
Logarithmic	the standard,	are inverses of each other	are inverses of each other	are inverses of each other	of
inverses	including tasks	and use these functions to	and use these functions to	and convert from one form	reasoning
(F.BF.5)	that may involve	solve real-world problems .	solve logarithmic and	into the other.	or
	one of the		exponential equations.		application
	following:				to solve
					the
	 Designing 				problem
	 Connecting 				
	 Synthesizing 				Does not
	 Applying 				meet the
	 Justifying 				criteria in
	 Critiquing 				a level 1
	 Analyzing 				
	 Creating 				
	Proving				

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