Functions

1.2 Explore inverse functions (and compositions)

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Produce inverse functions (F.BF.4)	Can extend thinking beyond the standard, including tasks that may involve one of the following: • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving	Can do **all** of the following: • Read values of an inverse function from a graph and table • Given a simple function, find its inverse • Compose functions to verify if one function is the inverse of another function	Can do **2** of the following: • Read values of an inverse function from a graph and table • Given a simple function, find its inverse • Compose functions to verify if one function is the inverse of another function	Can do **1** of the following: • Read values of an inverse function from a graph and table • Given a simple function, find its inverse • Compose functions to verify if one function is the inverse of another function	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1
Evaluate composed functions (F.BF.1c)		Evaluate the composition of 2 functions **in context of a situation**	Evaluate the **composition of 2 functions**	Evaluate a function for a given value and use that result to **evaluate** a second function	

F.BF.4 Find inverse functions.

a. (+)Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x-1) for $x \neq 1$.

b. (+) Verify by composition that one function is the inverse of another.

c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.

F.BF.1c Write a function that describes a relationship between two quantities.

c. (+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.

Functions

1.3 Explore function transformations

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Identify transform-ations and key features of graphs (F.IF.7a/b, F.BF.3)	Can extend thinking beyond the standard, including tasks that may involve one of the following: • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving	Identify the effect on a graph by replacing f(x) with **more than two** transformations: $f(x) + k$, $a\,f(x)$, $f(bx)$, $f(x + h)$ for specific positive and negative values of the constants a, b, h, and k Write a function given **more than two transformations.** Graph function transformations (quadratics, square root, cube root, linear, absolute value) and identify all related key features of a graph **in context of a situation**. ● lines of symmetry ● intercepts ● domain/range	Identify the effect on a graph by replacing f(x) with **two** transformations: $f(x) + k$, $a\,f(x)$, $f(bx)$, $f(x + h)$ for specific positive and negative values of the constants a, b, h, and k Write a function given **two transformations.** **Graph function transformations** (quadratics, square root, cube root, linear, absolute value) and identify all related key features of a graph. ● lines of symmetry ● intercepts ● domain/range	Identify the effect on a graph by replacing f(x) with a **single** transformation: $f(x) + k$, $a\,f(x)$, $f(bx)$, $f(x + h)$ for specific positive and negative values of the constants a, b, h, and k Write a function given **a transformation**. **Given the graphs** of functions (quadratics, square root, cube root, linear, absolute value) identify all related key features of a graph. ● lines of symmetry ● intercepts ● domain/range	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1

F.IF.7a/b Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
b. Graph square root, cube root, ~~and piecewise-defined functions, including step functions and~~ absolute value functions.

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.~~