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| **LG #** | **AF05** | **Standards:** | **F-BF.1.1, F-BF.2.4, F-BF.2.5** |
| **4.0** | **In addition to Score 3.0, in-depth inferences and applications that go beyond instruction to the standard.****The student will be able to:*** Decompose a composite function into three or more functions.
* Prove the inverse relationship between exponents and logarithms both algebraically and geometrically.

**No major errors or omissions regarding the score 4.0 content.** |
| **3.5** | In addition to 3.0, in-depth inferences and applications with partial success. |
| **3.0** | **Students will be able to build functions that model relationships between quantities, and new functions (inverse/composite) from existing functions**.**The student will be able to:*** Verify by composition that one function is the inverse of another (F-BF.2.4b)
* Produce an invertible function from a non-invertible function by restricting the domain (F-BF.2.4d)
* Combine standard function types using arithmetic operations. (For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model) (F-BF.1.1b)
* 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) (F-BF.1.1c)
* Determine an explicit expression, a recursive process, or steps for calculation from a context (BF.1.1a)
* Understand the inverse relationship between exponents and logarithms (F-BF.2.5)
* Use the relationship between exponents and logarithms to solve problems (F-BF.2.5)

**No major errors or omissions regarding the score 3.0 content (simple or complex).** |
| **2.5** | No major errors or omissions regarding 2.0 content and partial knowledge of 3.0 content. |
| **2.0** | **The student recognizes and describes specific terminology such as:**

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| * Function
 | * Explicit
 | * Recursive
 |
| * Logarithms
 | * Inverse Function
 | * Invertible Function
 |
| * Exponents
 | * Composition of Functions
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**The student will be able to:*** Solve an equation for a simple function f that has an inverse and write an expression for the inverse(F-BF.2.4a)
* Read values of an inverse function from a graph or a table, given that the function has an inverse (F-BF.2.4c)
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| **1.5** | Partial knowledge of the score 2.0 content, but major errors or omissions regarding score 3.0 content. |
| **1.0** | With partial understanding of some of the simpler details and processes and some of the more complex ideas and processes. |
| **0.5** | With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes. |
| **0.0** | Even with help, no understanding or skill is demonstrated |