|  |  |  |  |
| --- | --- | --- | --- |
| **LG #** | **A207** | **Standards:** | **A-SSE.2.4, F-BF.1.1, F-BF.1.2, F-BF.2.a,b, F-LE.1.4, F-LE.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:*** Justify using properties of exponents why $ab^{ct}=d$ and $log\_{b}\frac{d}{a}=ct$ are equivalent.
* Ilastrate how a simple geometric transformation changes a growth graph to a decay graph.

**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 construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric, or recursive sequence or series.****The student will be able to:*** Write an explicit and/or recursive expression of a function to describe a real-world problem. (F-BF.1.1.a)
* Combine standard function types using arithmetic operations. (F-BF.1.1.b)
* Write arithmetic and geometric sequences both recursively and with an explicit formula. (F-BF.1.2)
* Use arithmetic and geometric sequences both recursively and with an explicit formula to model situations. (F-BF.1.2)
* Translate between recursive and explicit forms of geometric and arithmetic sequences. (F-BF.1.2)
* Express the solution of the exponential model $ab^{ct}=d$, where a, c, and d are numbers and the base b is 2, 10, or e. (F-LE.1.4)
* Interpret the parameters in a linear or exponential function in terms of a context.

(F-LE.2.5)* Derive the formula for the sum of a finite geometric series when the common ratio is not 1. (A-SSE.2.4)

**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:**

|  |  |  |
| --- | --- | --- |
| * Geometric Sequence
 | * Common Logarithm
 | * Logarithm
 |
| * Arithmetic Sequence
 | * Exponential Growth
 | * Natural Logarithm
 |
| * Geometric Series
 | * Exponential Decay
 | * Common Difference
 |
| * Change of Base formula
* Term
 | * Exponential
* Recursive Rule
 | * Common Ratio
* Explicit Rule
 |

**The student will be able to:*** Determine an explicit expression or a recursive process for a function. (F-BF.1.1.a)
* Recognize arithmetic and geometric sequences. (F-BF.1.2)
* Evaluate a logarithm using technology. (F-LE.1.4)
* Use the Change of Base formula. (F-BF.2.a)
* Use the formula for the sum of a finite geometric series (When the common ratio is not 1) to solve problems. (A-SSE.2.4)
 |
| **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 |