3U –Summative

1. Find a piece of art that includes the following 6 functions:
   1. Linear function
   2. Quadratic function
   3. Square root function
   4. Reciprocal function
   5. Sinusoidal function
   6. Exponential function

Be sure that all six functions are oriented correctly according to one set of axes. Be sure you indicate WHERE you found your art – e.g. book and page number or web address.

1. On graph paper, draw the coordinate system (x- and y- axes)
2. Trace the parts of the piece of art that make up the six functions above.
3. Determine the equation of all six functions in relation to your x- and y- axes.
4. Determine the domain and range of your six functions.
5. List the transformations done to the parent functions to get your six functions.

The rubric follows on the next 3 pages….

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Equation 1: Linear Function**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. |

**Equation 2: Quadratic Function**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. | Strategy/ Procedures | Uses an efficient and effective strategy to solve the problem. | Uses an effective strategy to solve the problem. | Uses a strategy to solve the problem but it is not effective. | Does not use a strategy to solve the problem. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. | Mathematical Concepts | Shows complete understanding of the mathematical concepts used to solve the problem. | Shows substantial understanding of the mathematical concepts used to solve the problem. | Shows some understanding of the mathematical concepts needed to solve the problem. | Shows very limited understanding of the underlying concepts needed to solve the problem OR is not written. |

**Equation 3: Square Root Function**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. |

**Equation 4: Reciprocal Function**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. |

**Equation 5: Sinusoidal Function**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. |

**Equation 6: Exponential Function**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4 | 3 | 2 | 1 |
| Strategy/ Procedures | Uses an efficient and effective strategy to determine the equation. Enlists strategies to ensure that the equation models the function as best as possible. Enlists multiple strategies to determine equations | Uses an effective strategy to determine the equation. | Uses a strategy to determine an equation but it is only somewhat effective. | Strategy used has limited effectiveness. |
| Mathematical Concepts | Shows complete understanding of the mathematical concepts used to determine the equation, domain and range and transformations. Uses thorough understanding of mathematical concepts to work with more complicated functions that include one or more reflection. | Shows substantial understanding of the mathematical concepts used to determine the equation, domain and range and transformations. . | Shows some understanding of the mathematical concepts needed to determine the equation, domain and range and transformations. | Shows very limited understanding of the underlying concepts needed to domain and range and transformations. |

**Overall**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Explanation | Explanation is detailed and clear. | Explanation is clear. | Explanation is a little difficult to understand, but includes critical components. | Explanation is difficult to understand and is missing several components OR was not included. |
| Mathematical Terminology and Symbols | Advanced, correct terminology and symbols are used, making it very easy to understand what was done. | Correct terminology and symbols are used, making it easy to understand what was done. | Correct terminology and symbols are used, but it is sometimes not easy to understand what was done. | There is little use, or a lot of inappropriate use, of terminology and symbols. |
| Neatness and Organization | The work is presented in a neat, detailed, organized fashion that is easy to read. | The work is presented in a neat and organized fashion that is easy to read. | The work is presented in an organized fashion but may be hard to read. | The work appears sloppy and unorganized. It is hard to know what information goes together. |