**Review:**

1. Given and ,
   1. Which function decreases more rapidly?
   2. By what percentage does each function decrease each time period?

-----------------------------------------------------------------------------------------------------------------------------------------

1. Given the function ,
   1. Complete the following table. Use fractions, no decimals.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | −10 | −3 | −2 | −1 | 0 | 1 | 2 | 3 | 10 |
|  |  |  |  |  |  |  |  |  |  |

* 1. Draw a graph of *.*



* 1. Identify the vertical intercept.
  2. Does this function appear to have a horizontal intercept?
  3. As the values of the input variable *x* increase (become more positive), what happens to the output values?
  4. As the values of the input variable *x* decrease (become more negative), what happens to the output values?
  5. If you were to draw a horizontal line on the graph showing where the graph is leveling out (approaching), where would you draw that line? Draw the line on your graph.
  6. What is the equation of the line from **part g**?

**Definition:**

* Horizontal Asymptote:
* End Behavior:

1. Given the following equations,

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. Match the equations to the graphs below. **Justify your ordering in the space given.**



1. Sketch the graph of on the graph given above.
2. What point do all these functions have in common?
3. Will any of these functions have a horizontal intercept?
4. Identify the end behavior for all exponential functions in the form of y=Cax where a>1.
5. Write the equation of the horizontal asymptote for all exponential functions in the form of y=Cax where a>1.
6. What is the domain of an exponential growth function?
7. What is the range of an exponential growth function?

**Transformations of Exponential Functions**

1. Given the parent function, , fill in the table below.

|  |  |  |
| --- | --- | --- |
| **General Notation** | **Transformation in Words** | **Transformed Equation** |
|  |  |  |
|  | Shift down 3 units |  |
|  |  |  |
|  | Shift right 3 units |  |
|  | Reflection across the x-axis |  |
|  |  |  |

1. Use your sketch in #2b to sketch the graph of .



1. Identify the transformation in words.
2. Identify the vertical intercept of g(x).
3. Identify the horizontal intercept (if any) of g(x).
4. Identify the end behavior of g(x).
5. Write the equation for the horizontal asymptote of g(x).
6. Below are two transformed functions of the parent function. Fill in the table based on the graphs of the transformed function.

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Transformation in Words: |  | Transformation in Words: |
| Transformed Equation: |  | Transformed Equation: |
| Intercepts (if any):   * Horizontal: * Vertical: |  | Intercepts (if any):   * Horizontal: * Vertical: |
| End Behavior: |  | End Behavior: |
| Asymptote: |  | Asymptote: |
| Domain: |  | Domain: |
| Range: |  | Range: |

1. Given the following equations,

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. Match the equations to the graphs below. **Justify your ordering in the space given.**



1. Sketch the graph of on the graph given above.
2. What point do all these functions have in common?
3. Will any of these functions have a horizontal intercept?
4. Identify the end behavior for all exponential functions in the form of y=Cax where 0<a<1.
5. Write the equation of the horizontal asymptote for all exponential functions in the form of y=Cax where 0<a<1.
6. What is the domain of an exponential decay function?
7. What is the range of an exponential decay function?