**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_\_\_**

**Section 7.1 and 7.2: Graphs of Exponential Graphs**

Linear and quadratic parent functions are unique. However, there are two types of parent functions for exponential - **growth and decay**.

Exponential growth function the growth factor, *b*, is always (Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_)

Exponential decay the decay factor, is always (Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_)

**1) Exponential growth parent function f(x) = 2x**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | -1 | 0 | 1 | 2 | 3 | | **y** |  |  |  |  |  |   **Screen shot 2013-02-17 at 7** | a. What shape is the graph?  b. Where does it cross the y-axis?  c. Where does it cross the x-axis?  d. What is the Domain?  e.What is the Range?  f. As the independent variable increases, the dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

**2) Exponential Decay Parent Function**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | -1 | 0 | 1 | 2 | 3 | | **y** |  |  |  |  |  |   **Screen shot 2013-02-17 at 7** | a. What shape is the graph?  b. Where does it cross the y-axis?  c. Where does it cross the x-axis?  d. What is the Domain?  e. What is the Range?  f. As the independent variable increases, the dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

**Think about transformations we've done...**

- We can apply it to exponential functions also!!

****

**Graphs of exponential functions:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3) Graph the function f(x) = 3(4x) - 1   |  |  |  |  | | --- | --- | --- | --- | | x | -1 | 0 | 1 | | y |  |  |  |   Describe the transformation: | 4) Graph the function   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | x | -2 | -1 | 0 | 1 | 2 | 3 | | y |  |  |  |  |  |  |   Describe the transformation: |
| |  |  | | --- | --- | | 5) Graph the function f(x) =  Describe the transformation: | 6) Graph the function f(x) = 2x+3  Describe the transformation: | | | |

**Modeling Exponential Functions Problems**

7) Technetium-99m is a drug taken by a patient and then used to study tumors in the brain, lungs and other parts of the body. A patient takes a 1000-mg pill. The data below shows how much active ingredient remains in the body over 6-hour time intervals.

|  |  |
| --- | --- |
| **Technetium-99m Decay** | |
| # of 6-hour time intervals | Amount of Drug remaining (mg) |
| 0 | 1000 |
| 1 | 500 |
| 2 | 250 |
| 3 | 125 |

a) What is the initial value?

b) What is the growth/decay factor?

c) Write a rule for the function.

8) In television shows and movies you often see scientists studying patterns of data (growth of zombies, bacteria, etc). Below is a table that shows the number of zombies over a 4-day period.

1. What is the initial value?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Days | 0 | 1 | 2 | 3 | 4 |
| # of zombies | 2 | 8 | 32 | 128 | 512 |

1. What is the growth/ decay factor?
2. Write a rule for the function.