**Unit 12 Review - Exponential Functions**

**Station A**

1) If the function **f(x) = 5x**is graphed, what point on the graph is represented by f(-3)?

2) If the function **f(x)** **=** **7(1/3)x–1**is graphed, what point is represented by f(-2)?

3) Write the exponential equation that models the data from this table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | -2 | -1 | 0 | 1 | 2 | 3 |
| **y** | 81 | 27 | 9 | 3 | 1 | 1/3 |

4) Which equation shows a ***decreasing*** function that includes the point (1,4)?

1. y = 4(1/3)x b) y = 6(4)x c) y = 4(1/2)x–1  d) y = 2x + 2

5) Is it ***L*** (linear) or ***E*** (exponential) or ***N*** (neither)? Explain.

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**Station B**

1. The exponential function **g(x) = 725(1.09)x** models the amount of money in a savings account compounded annually. Explain the meaning of each part of the function.

 **725 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **1.09 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **0.09 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **g(x) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

2) Given the function **f(x) =** **45025(0.96)x**,identify the following:

 Decay Rate \_\_\_\_\_\_\_

 Initial Amount \_\_\_\_\_\_\_

 Decay Factor \_\_\_\_\_\_\_

 Common Ratio \_\_\_\_\_\_\_

1. The equation **M = 155(0.94)x** represents the depreciation of the value of a calculator over a 4 year period. Which of the following statements describes how the value of the calculator changes each year?
2. The value of the calculator decreases by $155 each year.
3. The value of the calculator decreases by 94% each year.
4. The value of the calculator decreases by 6% each year.
5. The value of the calculator decreases by $94 each year.

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**Station C**

1) Consider the functions numbered 1 – 4. Match each description to the function it describes.

1. linear function with a negative rate of change
2. linear function with a positive rate of change
3. exponential decay function
4. exponential growth function
5. f(x) = 0.9 (1.07)x
6. f(x) = 3x – 7
7. f(x) = 7(0.98)x
8. f(x) = 6 – 4x

1. Wimbledon is a major tennis tournament held in London, England each year. In singles tennis, 128 people are picked for men’s singles. When you lose a game, you are eliminated from the competition. Write an equation that models the number of people left, ***P***, after ***m***, matches are played.
2. The amount of books in a library, ***B***, over ***t*** years can be modeled by the 5 equations below. Each equation, numbered 1 – 5, models the amount of books in a different library.
3. *B* = 4500(1.06)*t* 2) *B* = 1600(0.92)*t*  3) *B* = 22000(0.75)*t*

 4) *B* = 1500(1.173)*t* 5) *B* = 4000(0.87)*t*

1. Which libraries are growing in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which library is growing the fastest in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which libraries are shrinking in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which library is shrinking the fastest in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 12 Review - Exponential Functions**

**Station D**

1. The value of a painting was $12,356 in the year 2005. Since then, the painting has been increasing in value at an annual rate of 2.4%.

1. Write an exponential model ***R(t)*** that represents the value of the painting ***t*** years after 2005.
2. If this growth rate continues, what will the approximate value of the painting be in the year 2018? Justify your response.
3. In an effort to go green, a local coffee shop has reduced the amount of Styrofoam cups they order per month. They are using the function, ***P*(*h*) = 5600(0.65)*m***to determine the approximate amount of Styrofoam cups, ***P(h***), they will order each month starting in January (*1st month*).
4. By what percent has the shop decided to reduce the amount of cups ordered per month?
5. How many more cups were ordered in month 5 than in month 6?
6. The company will stop ordering Styrofoam cups when they reach an amount less than 100 using the above model. What will be the last month the company orders cups?

3) Is it ***L*** (linear) or ***E*** (exponential)?

1. A virus that quadruples in size every hour
2. A bank account that accumulates 5% interest, compounded annually
3. A cell phone plan that charges $50 initially and $35 per month