Name Key

Hour

**Exponential Functions Study guide**

I can identify characteristics of an Exponential Function

1) $y = 12 \cdot 5^x$

Initial Value: 12

(Base) Constant Ratio: 5

Asymptote: $y=0$

(Growth) or Decay? Explain how you know.

because the base is greater than 1

2) $y = 9 \cdot \frac{3}{5}^x$

Initial Value: 9

Constant Ratio: 3/5

Asymptote: $y=0$

Growth or (Decay)? Explain how you know.

because the base is between 0 & 1

3) $y = \frac{1}{5}^x$

Initial Value: 1

Constant Ratio: 1/5

Asymptote: $y=0$

Growth or (Decay)? Explain how you know.

because the base is between 0 & 1

4) $y = 13^x \cdot 12$

Initial Value: 12

Constant Ratio: 13

Asymptote: $y=0$

(Growth) or Decay? Explain how you know.

because the base is greater than 1.

5) $y = \frac{8}{5}^x$

Initial Value: 1

Constant Ratio: 8/5

Asymptote: $y=0$

(Growth) or Decay? Explain how you know.

because the base is greater than 1.

6) $y = 0.5 \cdot 14^x$

Initial Value: 0.5

Constant Ratio: 14

Asymptote: $y=0$

(Growth) or Decay? Explain how you know.

because the base is greater than 1.

**7) Graph the function below**

$$y = \frac{1}{2}^{x}$$

Initial Value: 1

Constant Ratio: 1/2

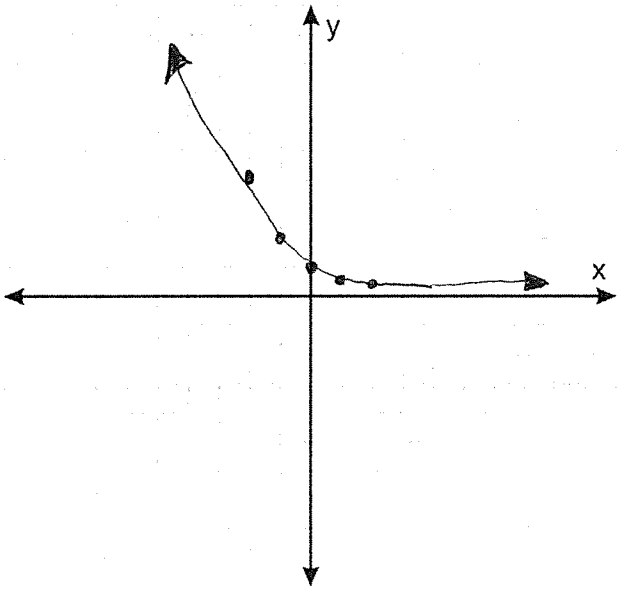
Asymptote: y=0

Growth or Decay? Explain how you know.

Because the Base is between 0 & 1.

**Complete the table and plot the 5 points on the graph.**

| X | Y |
|---|---|
| -2 | 4 |
| -1 | 2 |
| 0 | 1 |
| 1 | 0.5 |
| 2 | 0.25 |




**8) Graph the function below**

$$y = 2^{x}$$

Initial Value: 1

Constant Ratio: 2

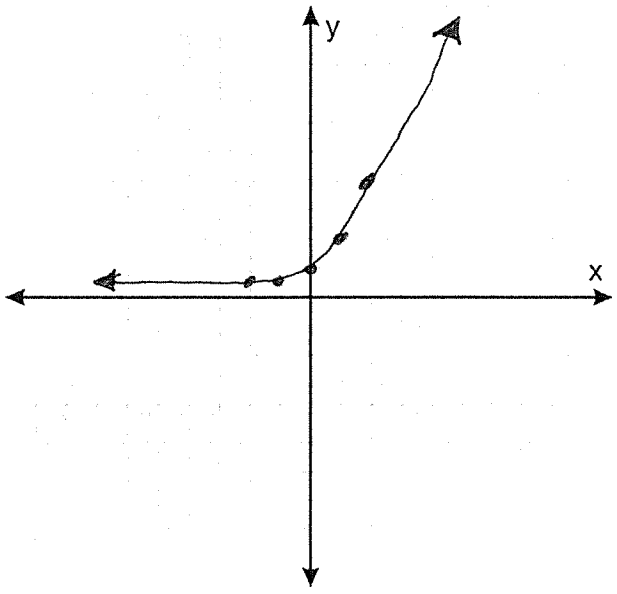
Asymptote: y=0

Growth or Decay? Explain how you know.

Because the base is greater than 1.

**Complete the table and plot the 5 points on the graph.**

| X | Y |
|---|---|
| -2 | .25 |
| -1 | .5 |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |



**Write an equation for the exponential functions below:**

9)

| x | y |
|---|---|
| -2 | 8 |
| -1 | 64 |
| 0 | 512 |
| 1 | 4096 |

$a=512 \quad b=8$

$64 \div 8 = 8$

$512 \div 64 = 8$

$4096 \div 512 = 8$

$y = a \cdot b^x$

Equation: $y = 512(8)^x$

10)

| x | y |
|---|---|
| 0 | 5000 |
| -1 | 1000 |
| 2 | 200 |
| 3 | 40 |

Equation: $y = 5000\left(\frac{1}{5}\right)^x$

11)

| x | y |
|---|---|
| -3 | 0.3125 |
| -2 | 1.25 |
| -1 | 5 |
| 0 | 20 |

Equation: $y = 20(4)^x$

12)

| x | y |
|---|---|
| -2 | 126.56 |
| -1 | 168.75 |
| 0 | 225 |
| 1 | 300 |

Equation: $y = 225\left(\frac{4}{3}\right)^x$

13)

| x | y |
|---|---|
| 0 | 36 |
| -1 | 6 |
| 2 | 1 |
| 3 | 0.16 |

Equation: $y = 36\left(\frac{1}{6}\right)^x$

14)

| x | y |
|---|---|
| -1 | 62 |
| 0 | 15.5 |
| 1 | 3.875 |
| 2 | 0.968 |

Equation: $y = 15.5\left(\frac{1}{4}\right)^x$

I can differentiate between linear and exponential functions.

15)

| x | y |
|---|---|
| 0 | 7.25 |
| 1 | 5 |
| 2 | 2.75 |
| 3 | 0.5 |

-2.25
-2.25
-2.25

Linear or Exponential?

Linear

Explain your reasoning.

Because the y-values are being subtracted by the same constant rate.

16)

| x | y |
|---|---|
| -1 | 0.36 |
| 0 | 4 |
| 1 | 44 |
| 2 | 484 |

4 ÷ 0.36 = 11
44 ÷ 4 = 11
484 ÷ 4 = 11

Linear or Exponential?

Exponential

Explain your reasoning.

Because the y-values are multiplied by the same rate.

**Explain if the situation represents a linear or exponential function. EXPLAIN HOW YOU KNOW.**

17) Ms. Kadry takes off 10 points for each day an assignment is turned in late. The assignments are worth 100 point each.

Linear because she subtracts 10 points each day

18) Ms. Beydoun has 4 rabbits. She expects them to double each year.

Exponential because they will double, this means multiply.

19) Ms. Lutsic is at Dave and Busters and buys 300 tokens. Each time you play a game you have to pay 15 tokens.

Linear because she subtracts 15 tokens each game.

20) Ms. Berg is giving out concert tickets. She starts with 1000 tickets and the number of tickets is halved every 30 minutes.

Exponential because the tickets are being divided in half at a constant rate.