Name: _____ Date: _____ HW #83 Id Exponentials

Tell which family each equation or table belongs to. Your choices are:

Constant, linear, absolute value, quadratic, or exponential.

1) $f(x) = 3x^2 - 1$

2) $f(x) = 4 \cdot \left(\frac{1}{2}\right)^x$

3) $f(x) = -2x + 1$

4) $f(x) = |x - 3| + 2$

5) $f(x) = 2$

6) $f(x) = -2 \cdot 6^x$

7)

x	y
9	2
3	-2
-3	-6
-9	-10

8)

x	y
-1	16
0	2
1	-2
2	4
3	20
4	46

9)

x	y
0	4
1	12
2	36
3	108
4	324

10)

x	y
2	5
3	7
4	9
5	11

11)

x	f(x)
-5	16
-3	16
-1	16
2	16
5	16

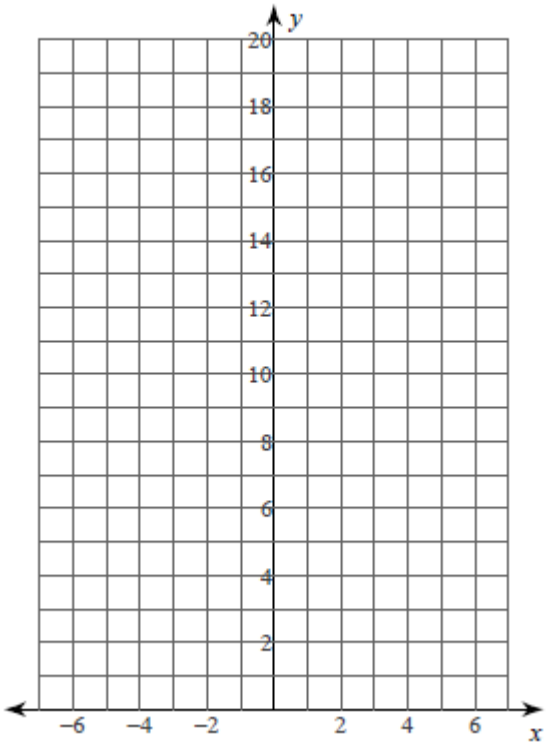
12)

x	f(x)
2	40.5
3	27
4	18
5	12
6	8

Name: _____ Date: _____ HW #84 Graph Exponentials

Graph each equation.

1) $y = 4 \cdot 2^x$

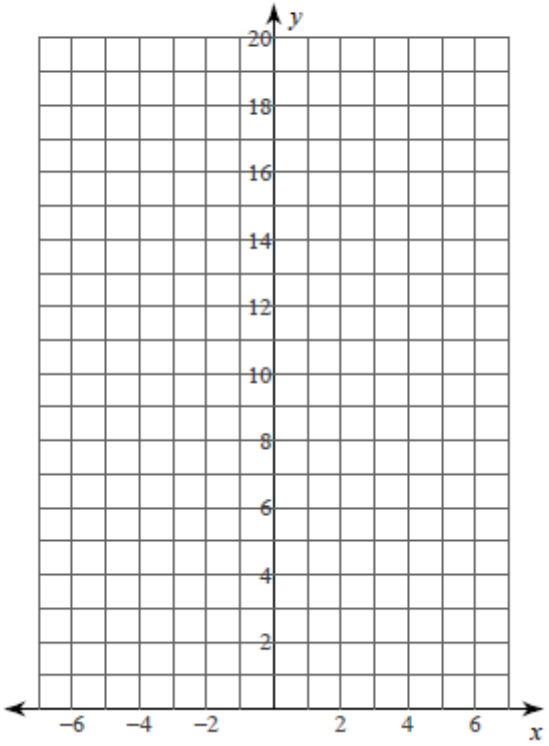


x	f(x)

This is exponential _____.

The asymptote is _____.

2) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



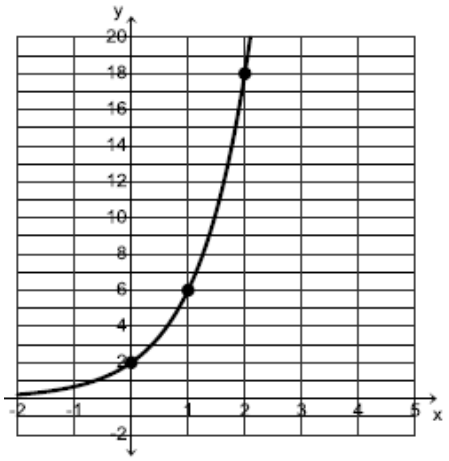
x	f(x)

This is exponential _____.

The range is _____.

Determine the exponential equation for each of the following graphs.

3) $f(x) =$ _____

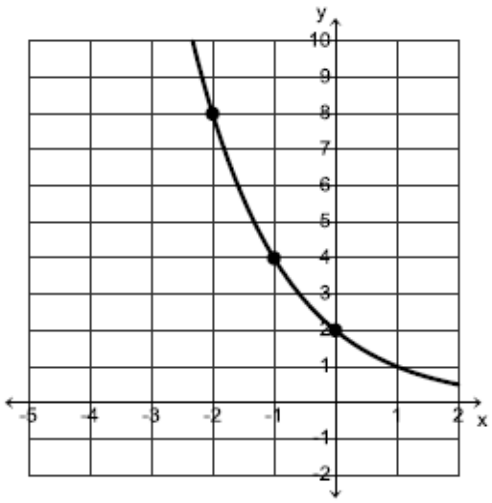


x	f(x)

This is exponential _____.

The domain is _____.

4) $f(x) =$ _____

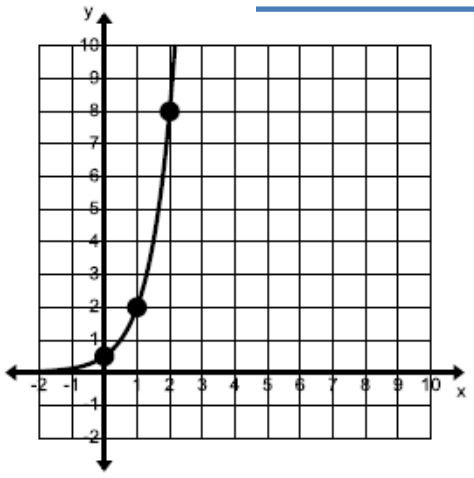


x	f(x)

This is exponential _____.

The asymptote is _____.

5) $f(x) =$ _____



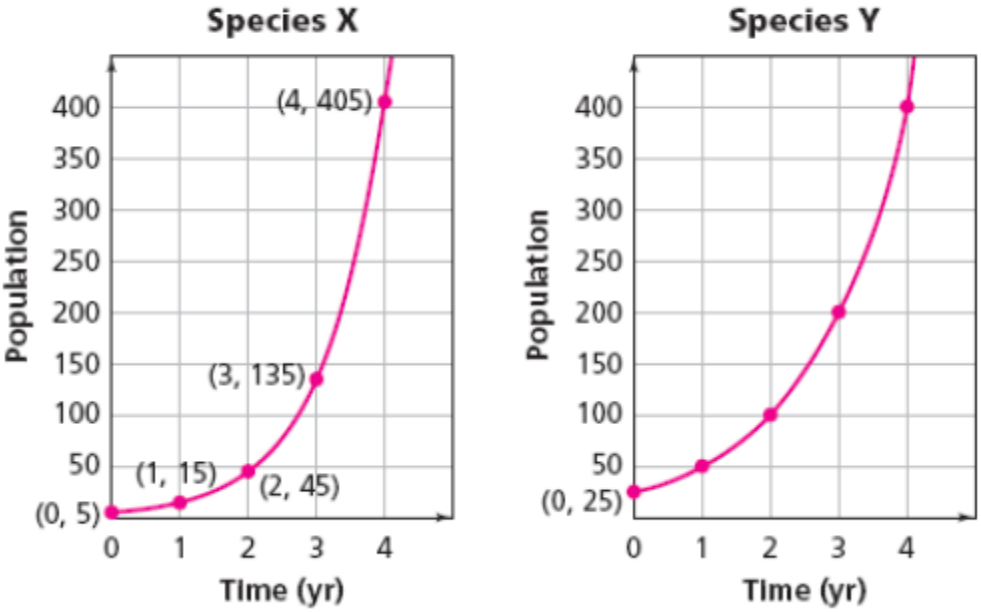
x	f(x)

This is exponential _____.

The range is _____.

Name: _____ Date: _____ HW # 85 Using Exp Equations

The following graphs show the population growth for two species.



1. Find the growth factor for each species. Which species is growing faster? Explain.

2. Find the initial population for each species. Which species started with a greater population? Explain.

3. Write an equation for each species.

4. For which species is (5, 1215) a solution? Explain.

A population of mice has a growth factor of 3. After 1 month, there are 36 mice. After 2 months, there are 108 mice.

5. How many mice were initially in the population (at 0 months)?

6. Write an equation for the number of mice in the population after any number of months.

7. When will the mice population reach 1,000,000

Many 19th and 20th century settlements were left to rot after natural disasters, wars or economic depressions forced their residents to flee. These “ghost towns” stand as eerie monuments to bygone eras, and some have even found a second life as tourist attractions and movie sets. One such town is Hashima Island, Japan which is 16 acres in size and was home to a coalmine. In 1950 it had a population of 5,200 people. The mine closed shortly after 1950 and the people started to leave. The decay of the town can be modeled by the equation $P(y) = 5200 \cdot \left(\frac{4}{5}\right)^y$ where P is the Population and y is the number of years since 1950.

8. What was the population in 1960?

9. When was the population less than 100?

Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated.

10. Write an equation for the number of participants after each round of play.

11. How many participants are left after 3 rounds?

12. How many rounds does it take to get a single winner?

Name: _____ Date: _____ HW # 86: Growth and decay

Cassie's grandmother wanted to help save for Cassie to go to college. She doesn't have much money right now, but found two different options at different banks.

1. If Cassie is currently 2 years old, which option will give her the most money when she goes to college at age 18? Explain.

2. If you have a long time to invest, which is better a higher initial value or a higher rate?

3. If Cassie is currently 15, which option will give her the most money when she goes to college at age 18? Explain.

4. If you have a short time to invest, which is better, a higher initial value or a higher rate?

5. A hypothetical strain of bacteria doubles every 5 minutes. One single bacterium was put in a sealed bottle at 9:00Am and the bottle was filled at exactly 10:00 AM. At what time was the bottle one-half full? (*Think in terms of the doubling time.)

6. A computer valued at $6500 depreciates at the rate of 14.3% per year.

   a. Write a function that models the value of the computer.

   b. Find the value of the computer after three years.

7. The world population in 2000 was approximately 6.08 billion. The annual rate of increase was about 1.26%.

a. Find the growth factor for the world population.

b. Suppose the rate of increase continues to be 1.26% . Write a function to model the world population

c. Let x be the number of years past the year 2000. Find the world population in 2010.

8. Find a bank account balance if the account starts with $100, has an annual rate of 4%, and the money left in the account for 12 years.

9. In 1985, there were 285 cell phone subscribers in the small town of Centerville. The number of subscribers increased by 75% per year after 1985. How many cell phone subscribers were in Centerville in 1994?

10. The population of Winnemucca, Nevada, can be modeled by $P=6191(1.04)^t$ where t is the number of years since 1990. What was the population in 1990? By what percent did the population increase by each year?

11. You have inherited land that was purchased for $30,000 in 1960. The value of the land increased by approximately 5% per year. What is the approximate value of the land in the year 2011?

12. During normal breathing, about 12% of the air in the lungs is replaced after one breath. Write an exponential decay model for the amount of the original air left in the lungs if the initial amount of air in the lungs is 500 mL. How much of the original air is present after 240 breaths?

13. Write an exponential function to model each situation. Find the value of each function after five years.

a. A $12,500 car depreciates 9% each year

b. A baseball card bought for $50 increases 3% in value each year.