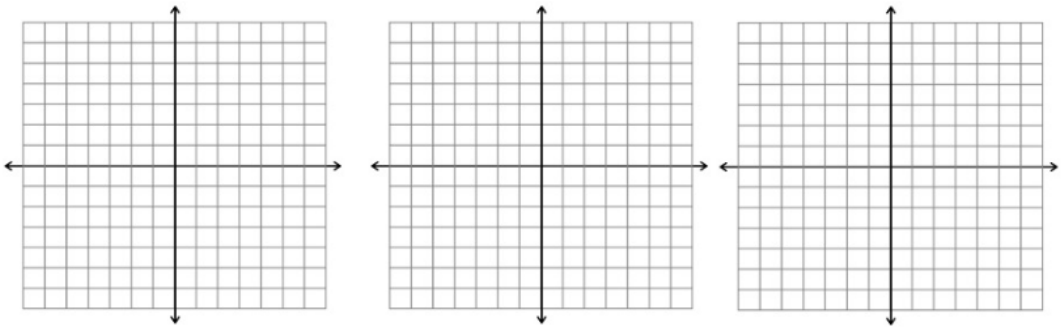
$f(x) = \frac{1}{2}^{X}$ $f(x) = \frac{1}{2}^{X+3}$ $f(x) = \frac{1}{2}^{-X} + 3$



Initial Value: (,) Initial Value: (,) Initial Value: (,)

Asymptote: Asymptote: Asymptote:

$f(x) = ab^x$ a = initial value b = growth/decay factor.

1. Population of Concord, NC is 80,975 and grows at a rate of 1.2% per year. Write an exponential function to model this situation.

a=80,975 b=1.012 $f(x) = 80975(1.012)^x$ r=1.2%

100%
+1.2%
101.2%

2. Your savings account has an initial deposit of $1,000 and earns 15% interest each year. Write an exponential function to model the situation. What will be your total balance after 15 year?

growth a=1000 b=1.15 $f(x) = 1000(1.15)^x$ $f(15) = 8137.06$

100%
+15%
115%

3. A new truck is sold for $32,000 and depreciates at a rate of 7% yearly. Write a function that models the value of the truck after *t* years. What is the value of the truck after 5 years?

a = 32,000 b = .93 $f(x) = 32000(.93)^x$ $f(5) = 22262.03$

100%
-7%
93%

* Time must match

4. The initial population of bacteria is 3 and grows at a rate of 80% per hour. Write a function that models the population after *h* hours. What is the population after 24 hours?

Exponential Growth/Decay HW

Determine if the function represents a growth/decay. Identify the initial value, growth factor and rate. (Do not graph)

1. $y = 2(3.5)^x$ 2. $y = 4.2(.09)^x$ 3. $y = 5\left(\frac{1}{3}\right)^x$ 4. $y = 21\left(\frac{5}{2}\right)^x$ 5. $y = 12\left(\frac{1}{4}\right)^x$

6. The mice population is 25,000 and is decreasing by 20% each year. Write a model for this situation.

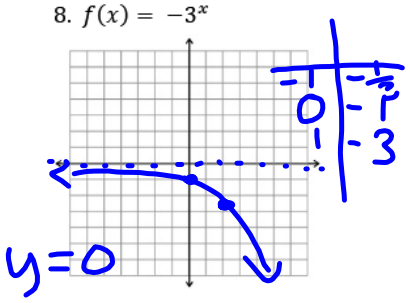
   a. Given the model for #6, what will be the mice population after 3 years?

7. A house that costs $200,000 will appreciate in value by 2% each year. Write a function to model the cost of the over time.

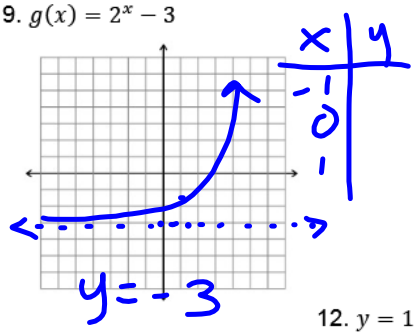
   a. Find the value of the house at the end of 10 years.

Graph the following functions. State the initial value, domain, range and asymptote.

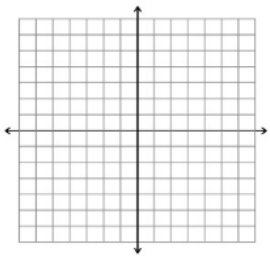
8. $f(x) = -3^x$



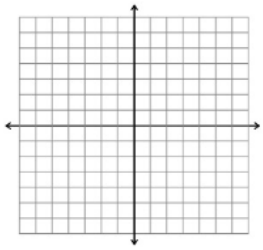
9. $g(x) = 2^x - 3$



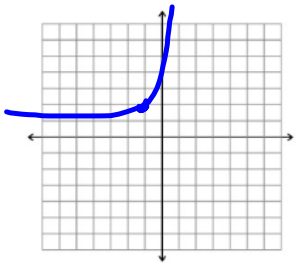
10. $h(x) = 10^{x+3}$



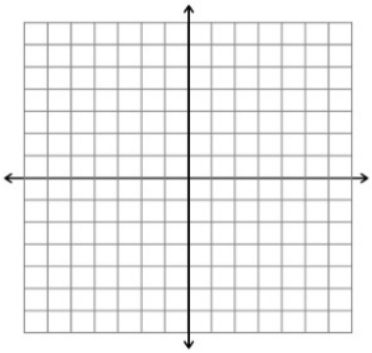
11. $f(x) = -3^{-x}$



12. $y = 1 + 2^{x+1}$



13. The consumption of soda has increased each year since 2000. The function $C(t) = 179(1.029)^t$ models the amount of soda consumed in the world, where C is the amount consumed in billions of liters and t is the number of years since 2000. **Graph and sketch the function. How much soda was consumed in 2005?**



Stat, Edit, L_1, L_2
Stat, Calc: 0 ExpReg

Exponential Regression name_____

1. In 1960, Walter purchased a plot of land for $10,000. The table shows how the value of the land has changed over time.

$L_1 \rightarrow X =$ 0 5 10 15 20

Year	1960	1965	1970	1975	1980
$L_2 \rightarrow$ Value	10,000	21,000	41,000	82,000	163,000

Exp. growth

Try using x = 0 to represent the year 1960.

Using your graphing calculator, use exponential regression to find an equation that best fits the data. Then, use the equation to predict what the land will be worth in the year 2020. X=60

Equation: y = $10209.56(1.15)^x$

Initial value: 10209.56 Growth/Decay% 15

In the year 2020: $44,758,698.23

X=60

2. The water supply of a small town was contaminated in 1970. The following table shows the population change over time.

X = 0 1 3 4 5

Year	1970	1971	1973	1974	1975
Value	2500	1195	317	160	72

Try using x = 0 to represent the year 1970.

Using your graphing calculator, use exponential regression to find an equation that best fits the data. Then, use the equation to predict what the land will be worth in the year 2020.

Equation: y = $2487.85(.4975)^x$

Initial value: _____ Growth/Decay% _____

Predict the population in 1977 _____

In what year will the population reach 0? _____