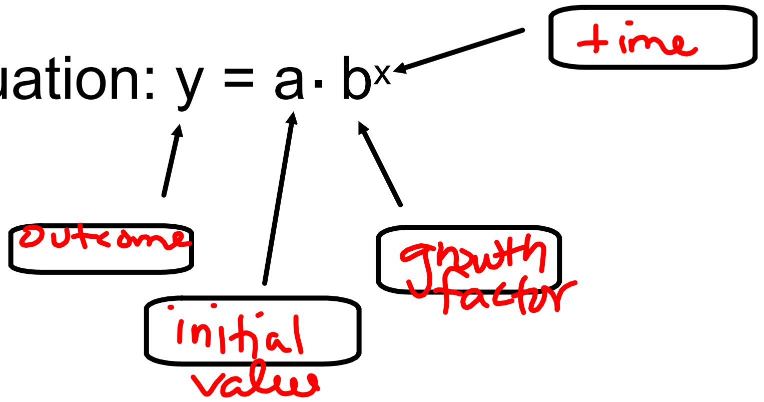
Air Review(Day 3)

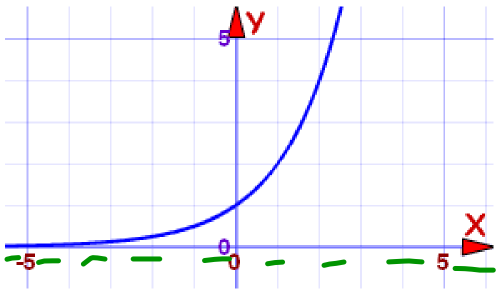
Name:______________________________

PART A: Exponential Functions

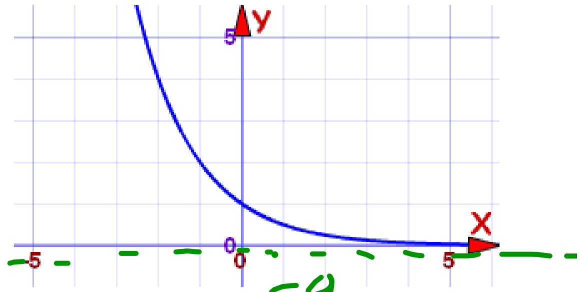
Equation: $y = a \cdot b^x$



Growth: $b > 1$



Decay: $0<b < 1$



5%
1.05

- Increasing by % --- ADD to 100% to get b!
- Decreasing by % --- Subract from 100% to get b!
  - Doubling b = 2, Tripling b = 3, etc.

1-.05
.95

Asymptote @ x-axis! (y=0)

x	y
1	2
2	6
3	22
4	67
5	300

Desmos! $y_1 \sim a(b)^{x_1}$

Fit an exponential function to this data set.

The population of snails in a tank at the aquarium is found to triple every year. Mark visits the aquarium and counts 80 snails in the tank.

Write a function $f(n)$ to model the number of snails in the tank n years after Mark's visit.

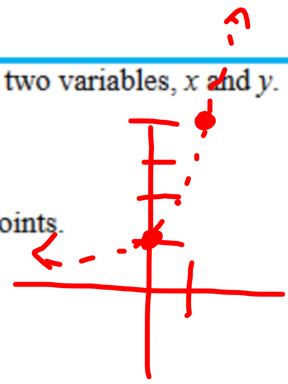
$f(n) =$ $80(3)^n$

$b = 3$
$a = 80$
$x \Rightarrow n$

The points (0, 1) and (1, 4) are contained in the graph of an equation with only two variables, x and y.

Select all of the true statements.

- [x] There is exactly one equation in the form $y = mx + b$ that contains these points.
- [ ] There are two equations in the form $y = mx + b$ that contain these points.
- [ ] There are no equations in the form $y = a \bullet b^x$ that contain these points.
- [x] There is exactly one equation in the form $y = a \bullet b^x$ that contains these points.
- [ ] There is more than one equation in the form $y = a \bullet b^x$ that contains these points.



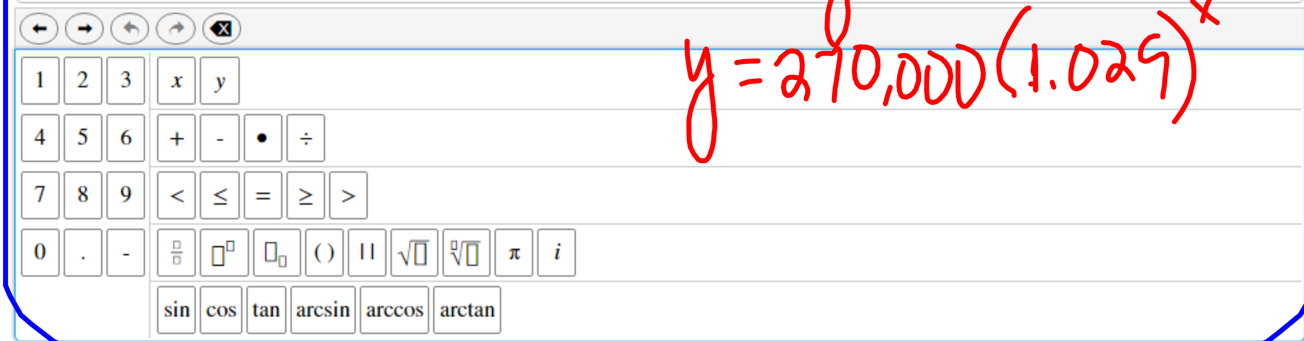
A scientist is studying wildlife. She estimates the population of bats in her state to be 270,000. She predicts the population to grow at an average annual rate of 2.9 percent.

Using the scientist's prediction, create an equation that models the population of bats, y, after x years.

a = 270,000
$1.029 = b$

$y = ab^x$

$y = 270{,}000(1.029)^x$



The population of rabbits on a large island doubles every year. On January 1, the population is 150 rabbits.

Which equation can be used to find the number of years, x, it will take for the population to reach 4,800?

Ⓐ $4{,}800 = 2x + 150$

Ⓑ $4{,}800 = 2 \cdot 150^x$

Ⓒ $4{,}800 = 2^x + 150$

Ⓓ $4{,}800 = 150 \cdot 2^x$

$b = 2$ $a = 150$

$y = 150(2)^x$

$y = ab^x$

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?

$a = 285$ $b = 1.75$ $x = \text{time}$

1985-1994

$x = 9$

$y = 285(1.75)^9$

43,871.99

43,872

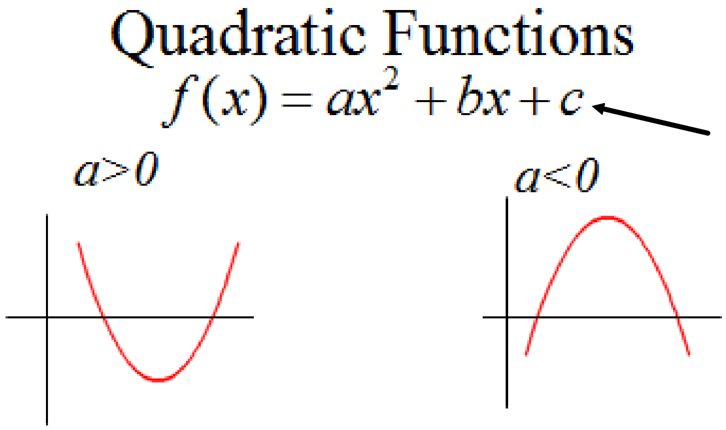
Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated. How many players remain after 5 rounds?

$a = 128$ $b = \frac{1}{2}$ $x = 5$

$y = 128\left(\frac{1}{2}\right)^5$

$y = 4$

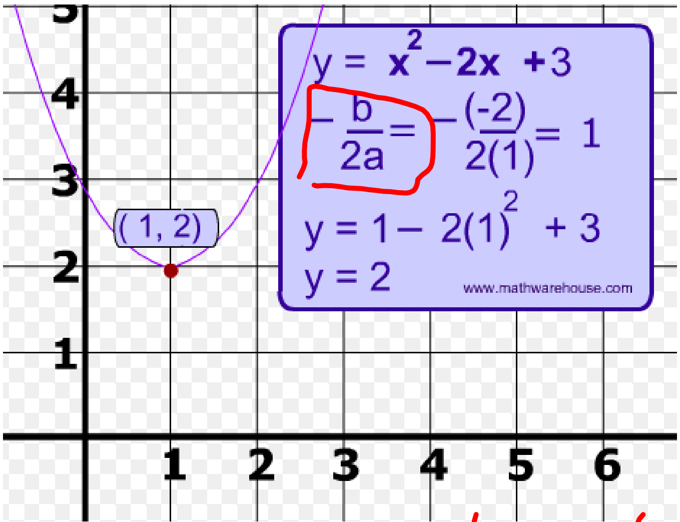
PART B: Quadratic Functions

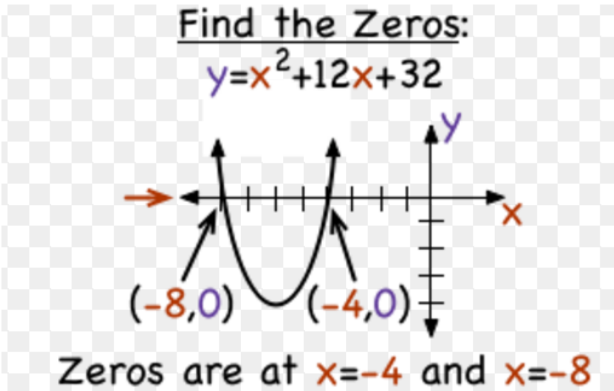


y-int

Vertex (Min or Max):

Zeros: (X-Intercepts)





$x = -\frac{b}{2a}$ (,)

Which correctly factored form of the function $f(x) = 36x^2 + 15x - 6$ can be used to identify the zeros?

Ⓐ $f(x) = (4x - 1)(3x + 2)$

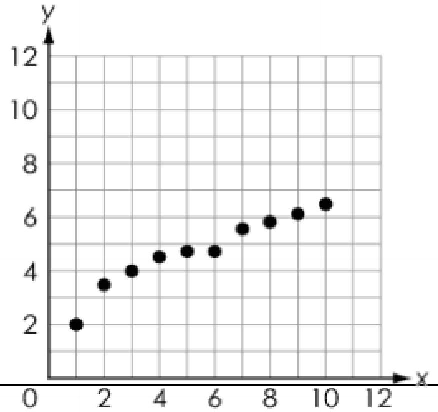
Ⓑ $f(x) = (12x - 2)(3x + 3)$

Ⓒ $f(x) = 3(4x - 1)(3x + 2)$

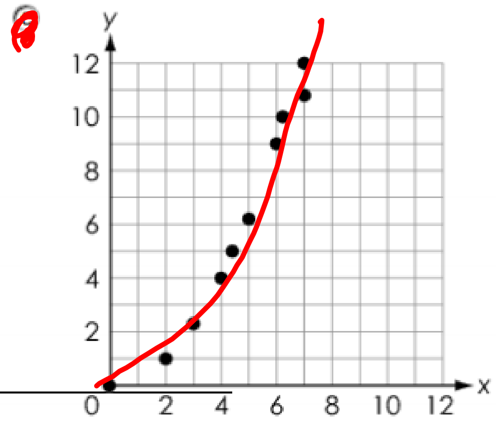
Ⓓ $f(x) = 3(12x - 2)(3x + 3)$

Which scatterplot represents the data that would be best modeled by a quadratic function?

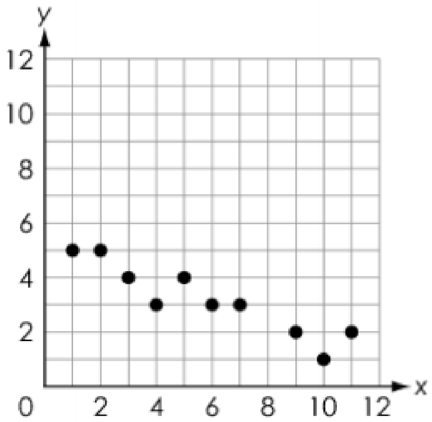
Ⓐ



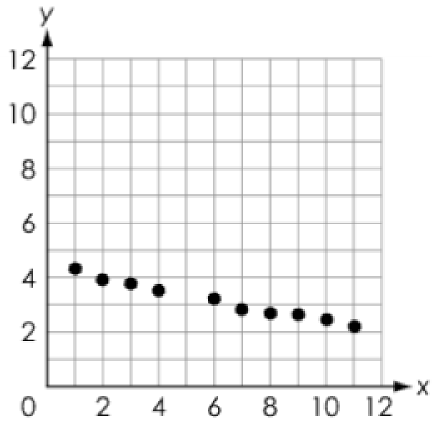
Ⓒ



Ⓑ



Ⓓ



Consider the function $f(x)=x^2-5x-14$.
Are the numbers in the chart zeros of the function?
Select Yes or No in each row.

	Yes	**No**
2	☐	☐
7	☐	☐
-2	☐	☐
-7	☐	☐

The graph of a quadratic function $f(x)$ intersects the x-axis at -6 and 4.

What is a possible equation for $f(x)$?

$f(x) =$ ______

A function is shown.

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

Use the Add Point tool to show the x-intercepts and maximum or minimum of the function.