

Functions can be represented by:

- Verbal descriptions
- Algebraic equations
- Numeric tables
- Graphs

Let's review linear and quadratic functions.

Linear Functions

- Verbal description:

You are driving to visit your best friend in Gulfport. Since you have a long drive ahead, you turn on your cruise control. The cruise control keeps your car traveling at a constant rate of 60 mph.

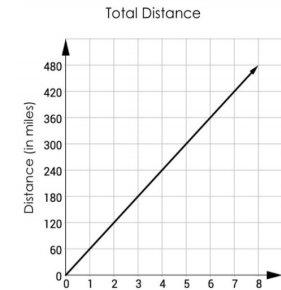
- Algebraic equation:

The situation is represented by the function $f(h) = 60h$. Your distance, $f(h)$, in miles, depends on your time, h , in hours.

- Graph:

- Numeric table:

h	$f(h)$
1	60
2	120
3	180
4	240
5	300
6	360
7	420



Quadratic Functions

- Verbal description:

You are observing the height of a ball as it's dropped from a 150 ft tall building. Because of the force of gravity, the more time that passes, the faster the ball travels. The ball does not travel at a constant speed, like your car on cruise control.

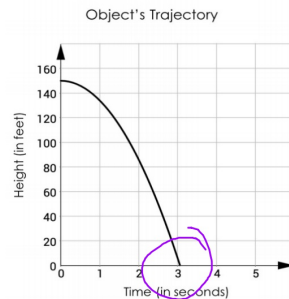
- Algebraic equation:

The height of the ball (h), in feet, is a function of, or depends on, the time (t), in seconds. The quadratic function can be represented by the equation $h(t) = -16t^2 + 150$.

- Graph:

- Numeric table:

t	$h(t)$
1	134
2	86
3	6



Exponential Functions

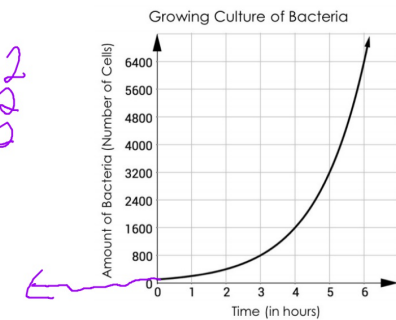
- Verbal description:

You are performing an experiment in science class in which you start with 100 bacteria and the amount of bacteria doubles every hour.

- Numeric table:

t	$b(t)$
0	100
1	200
2	400
3	800
4	1,600
5	3,200
6	6,400

- Graph:

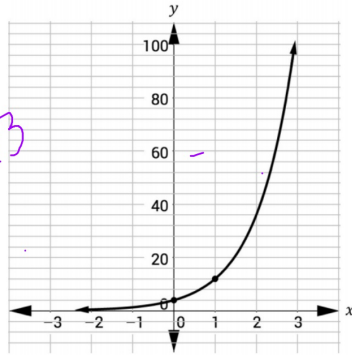


Let's Practice!

$y = mx + b$
 $y = ax^b + c$
 $f(x) = a \cdot b^x$
 $a = y\text{-int.}$
 $b = \text{common ratio}$

1. The table and graph below represent an exponential function:

x	y
-1	$\frac{4}{3}$
0	4
1	12
2	36
3	108



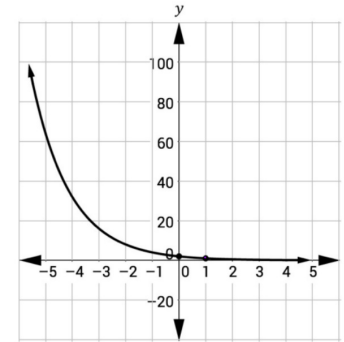
- a. Write an equation for the exponential function.

$f(x) = 4 \cdot 3^x$

Try It!

2. The table and graph below represent an exponential function.

x	y
-1	4
0	2
1	1
2	$\frac{1}{2}$
3	$\frac{1}{4}$

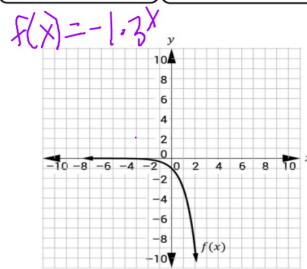
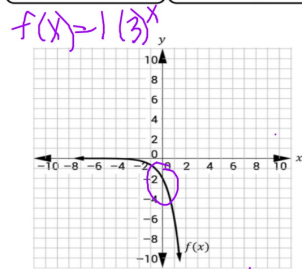


$a = y\text{-int}$
 $b = \text{common ratio}$

- a. Write an equation to represent the exponential function.

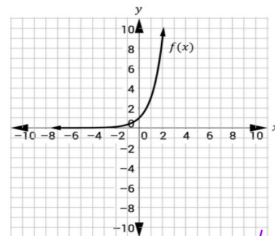
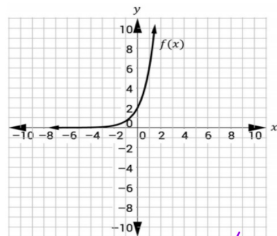
$f(x) = 2 \cdot \left(\frac{1}{2}\right)^x$

$f(x) = 3^x$ $f(x) = 2 \cdot 3^x$ $f(x) = -3^x$ $f(x) = -2 \cdot 3^x$



$f(x) = -2 \cdot 3^x$

$f(x) = -1 \cdot 3^x$



$f(x) = 2 \cdot 3^x$

$f(x) = 1 \cdot 3^x$