Functions - What are they?!

Webster defines functions as...

A **function** is a special relationship where each input has a single output

Types of Functions

Linear

Non-Linear (Quadratic/Exponential)

x	y
-2	-2
-1	2
0	6
1	10
2	14

+4 +4 +4 +4

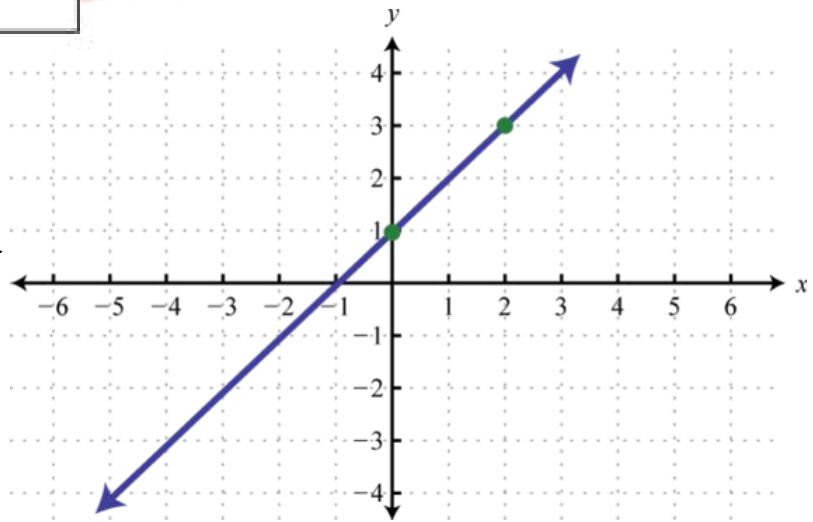
Lucy pays $224 dollars in advance on her account at the health club. Each time she visits the club, $7 is deducted from the account. Write an equation

linear equation

$Y = mx + b$

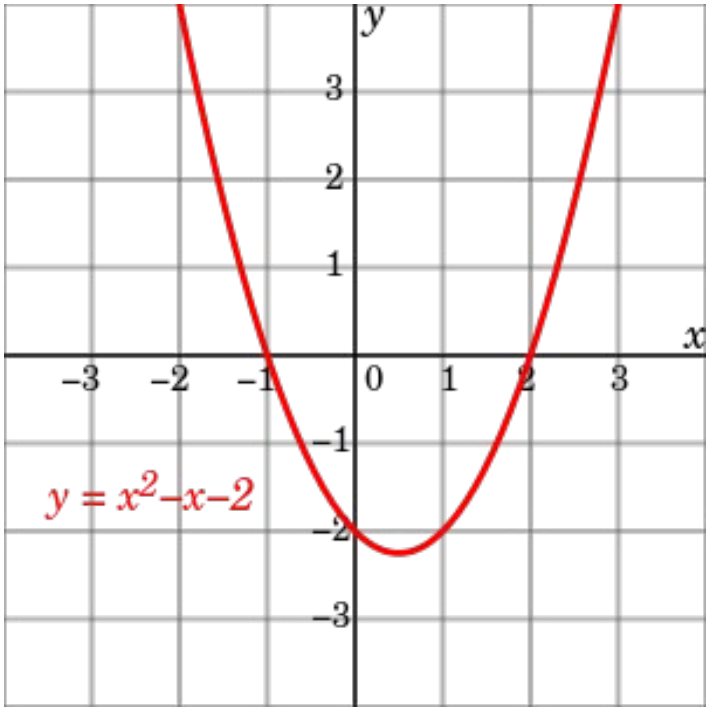
slope y-intercept

LINEAR



$ax^2 + bx + c = 0$

Quadratic



Alain throws a stone off a bridge into a river below. The stone's height above the water in meters, $h(x)$, depends on time in seconds after throwing, x, and can be modeled with the function $h(x) = -5x^2 + 10x + 15$.

x	y
-3	
-2	
-1	
0	
1	
2	
3	

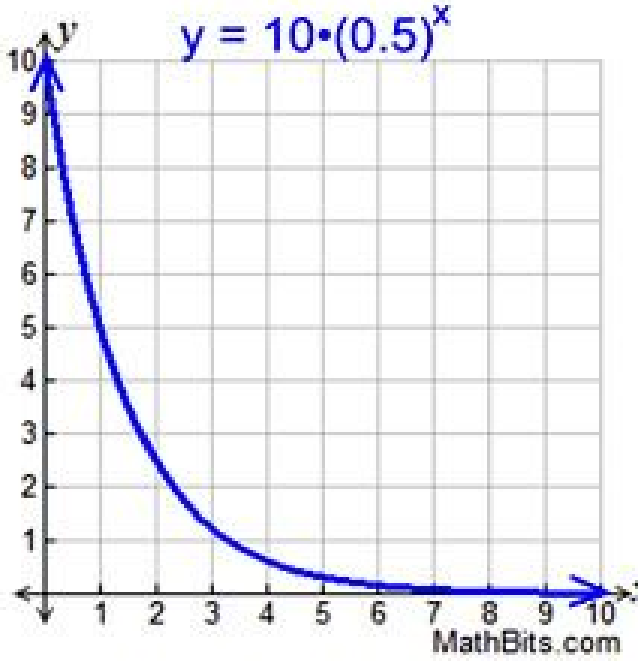
$y = x^2 + 3x + 2$

x	y
-3	2
-2	0
-1	0
0	2
1	6
2	12
3	20

EXPONENTIAL

5) A certain drug decays at a rate of 15% per hour. If the initial dose is 500 mg and it is not safe to drive until there is only 50 mg left in a person's system, how long will it be until it is safe for someone to drive?

$A = P(1 - r)^t$



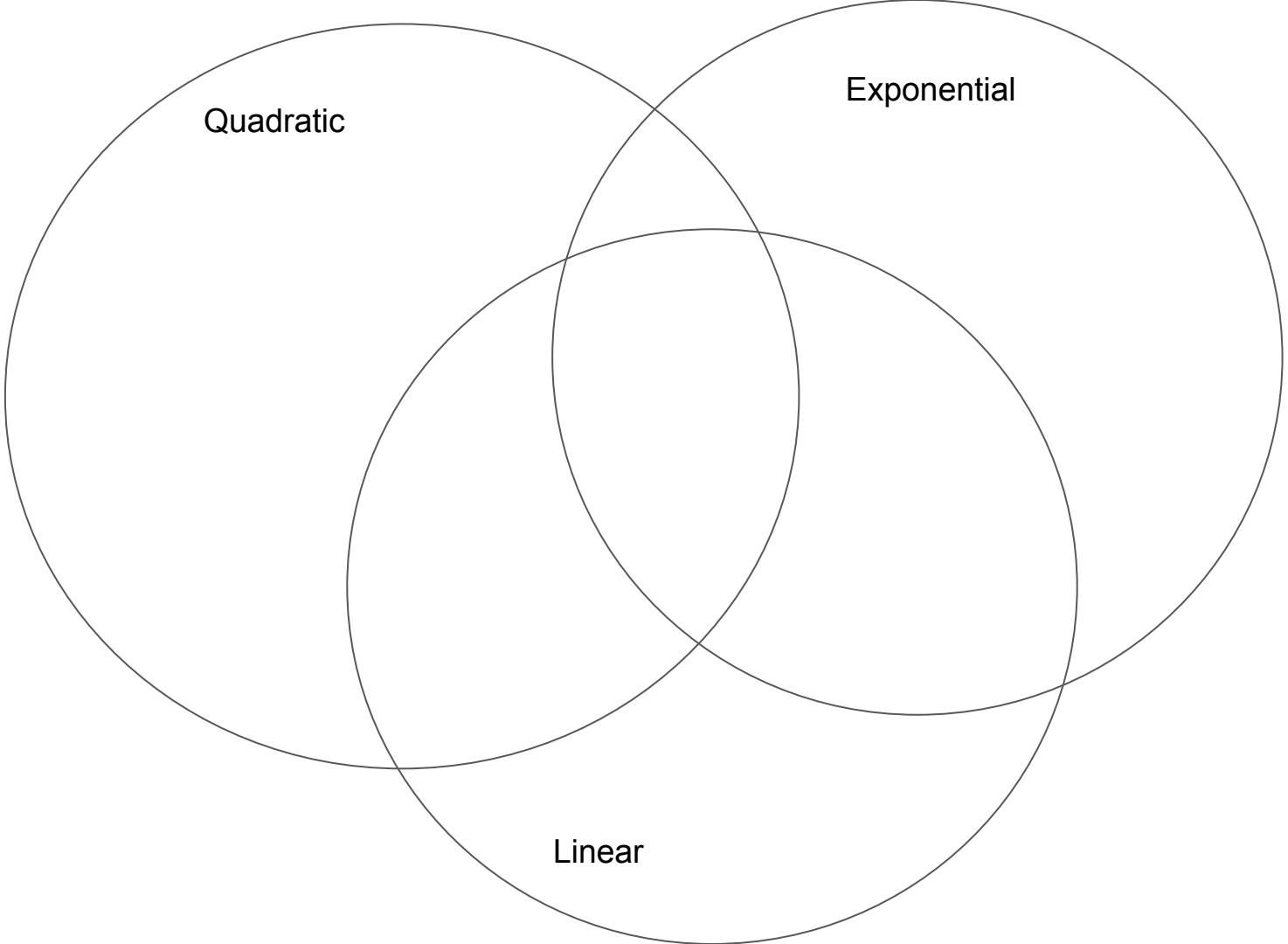
x	0	1	2	3	4
y	1	3	9	27	81

×3 ×3 ×3 ×3

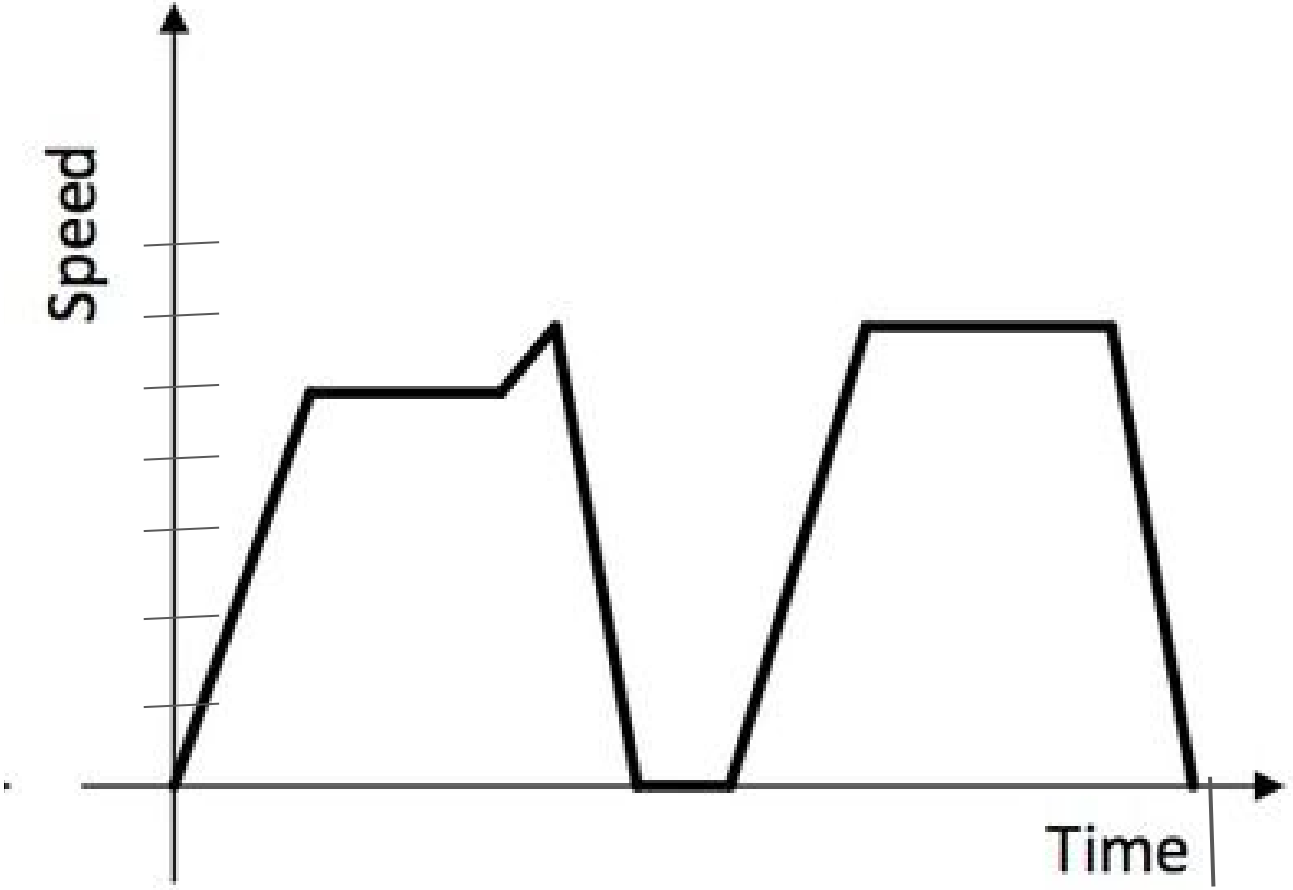
Exponential Function Form

$$Y = ab^x$$

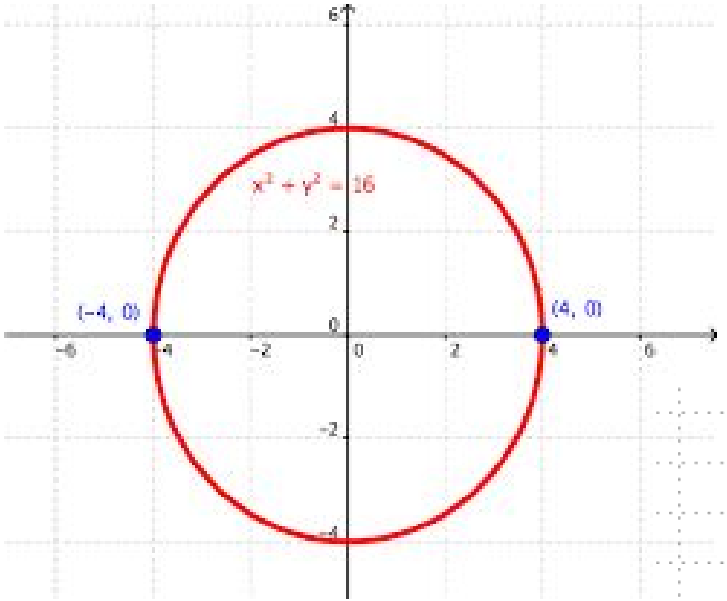
- x: Exponent of x make this an exponential function
- a: Y-intercept at (0, a)
- b: Growth or Decay

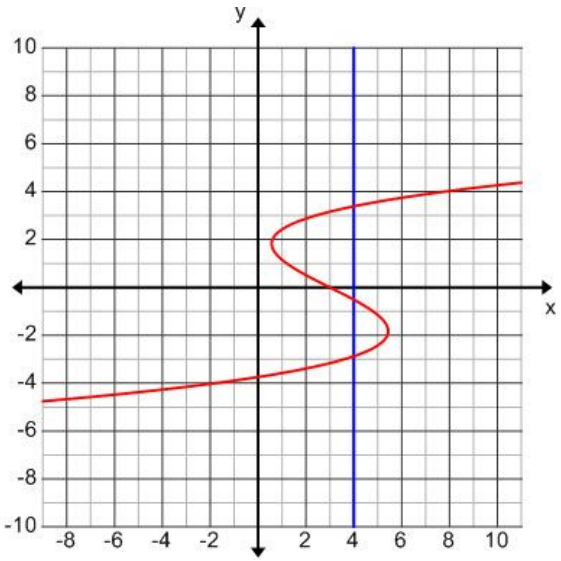

Quadratic
Exponential
Linear

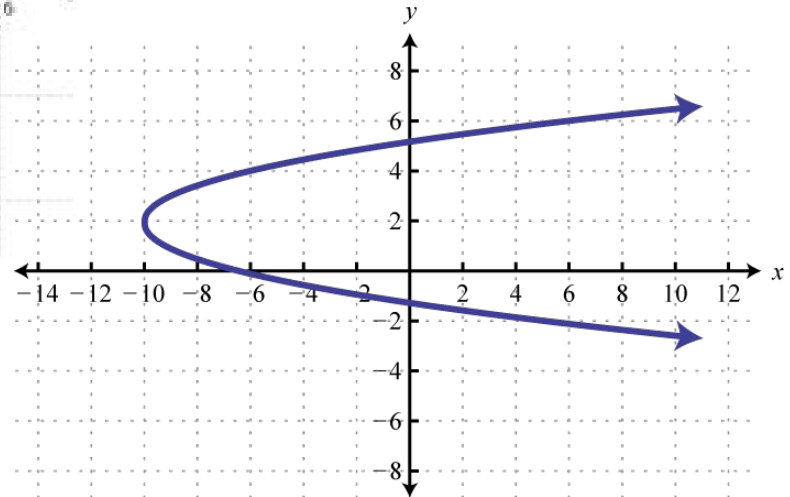
DIXI AND ROYD


Speed
Time

Examples of Non-Functions

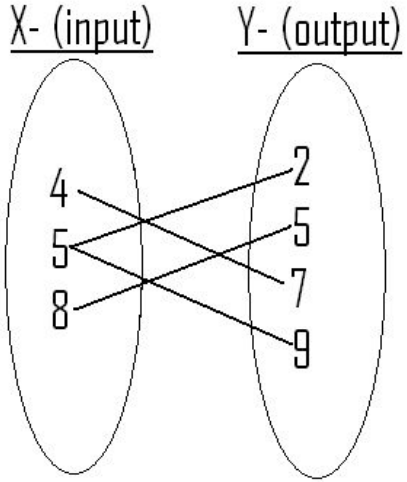






Why are these not functions?

- One Input to One Output
- Vertical Line Test



X	Y
1	2
2	4
1	5
3	8
4	4
5	10