MA 137 – Calculus 1 for the Life Sciences

Reminder: Out of town this Wed & Fri.

Remote class

No office hours this Wed.

Functions

A function is a rule that assigns a number x to every number $f(x)$.

Ways to represent functions

Table

x	$f(x)$
0	1
1	2
2	4
3	8

Formula

$$f(x) = 2^x$$

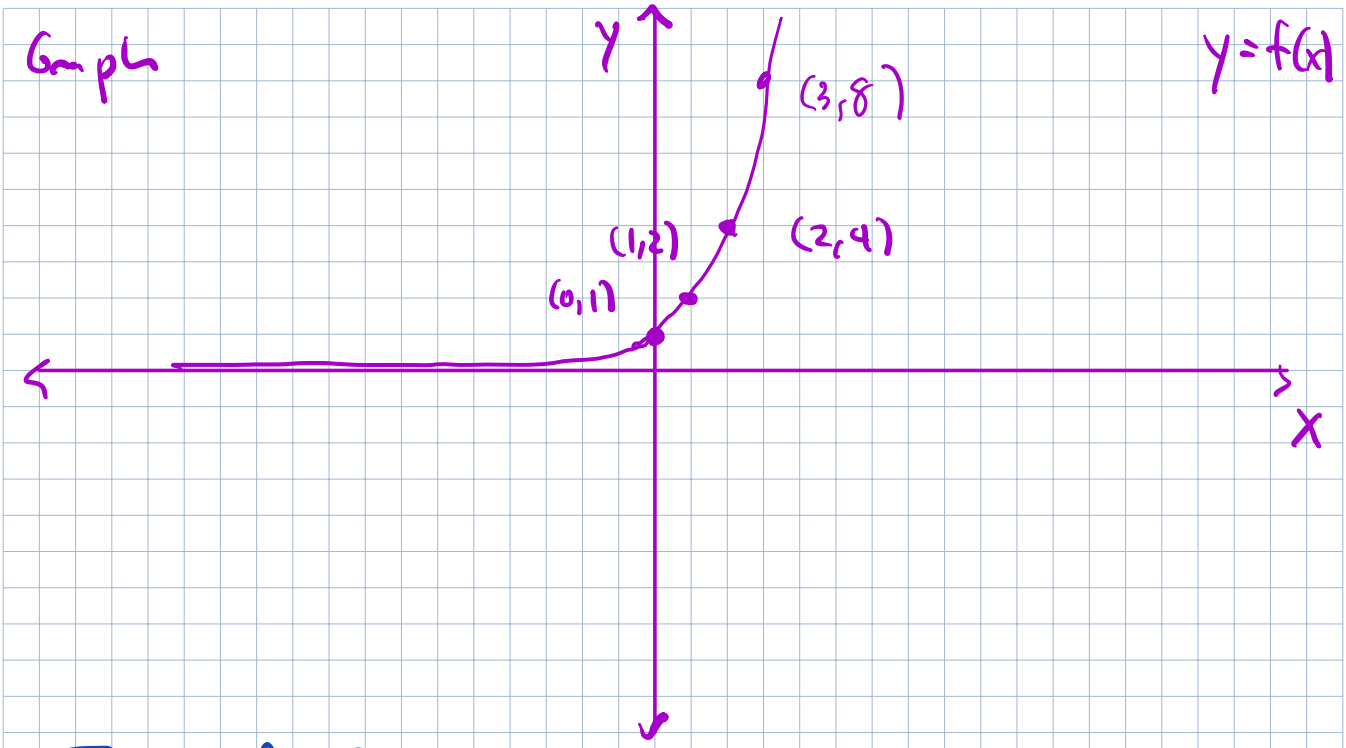
$$f(1) = 2^1 = 2$$

$$f(2) = 2^2 = 4.$$

$$f(5) = 2^5 = 32.$$

Graph

Graph



$y = f(x)$

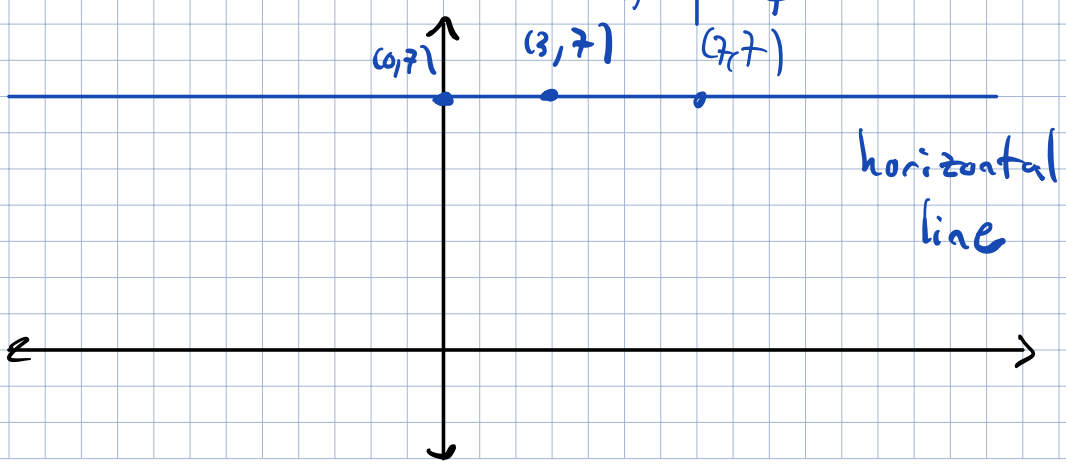
Types of Functions

Constant Functions

$f(x) = c$

ex: $f(x) = 7$

x	f(x)
0	7
1	7
2	7
3/2	7
π	7



Linear Functions

$f(x) = m \cdot x + b$

x	f(x)
0	3
1	5
2	7
3	9

m: slope

b: y-intercept

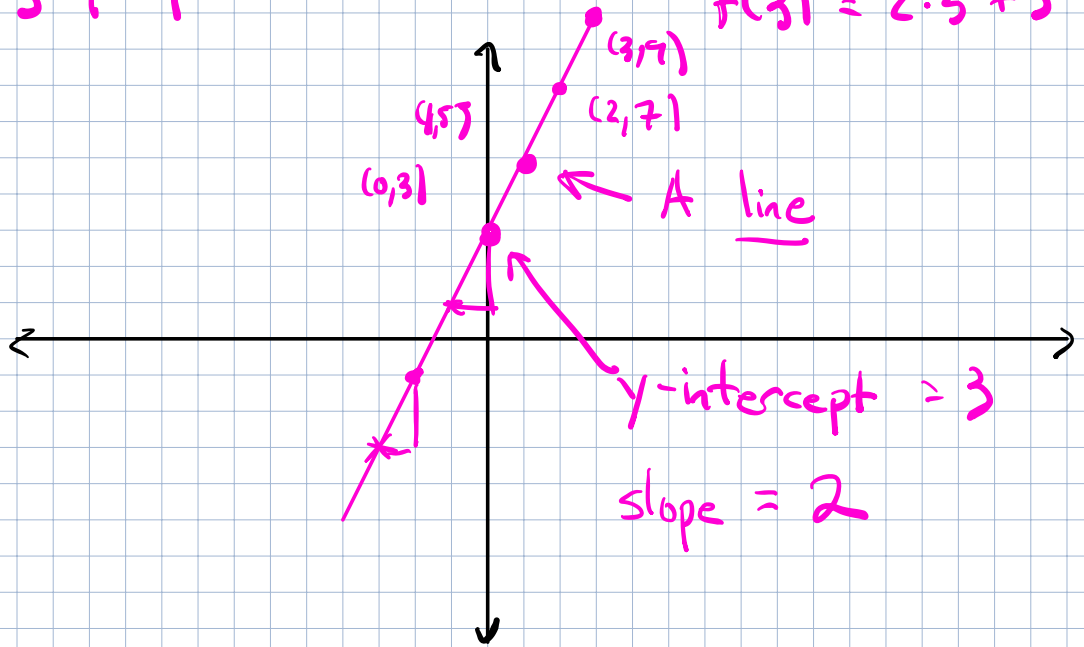
ex: $f(x) = 2x + 3$

$f(0) = 2 \cdot 0 + 3$

$f(1) = 2 \cdot 1 + 3$

$f(2) = 2 \cdot 2 + 3$

$f(3) = 2 \cdot 3 + 3$

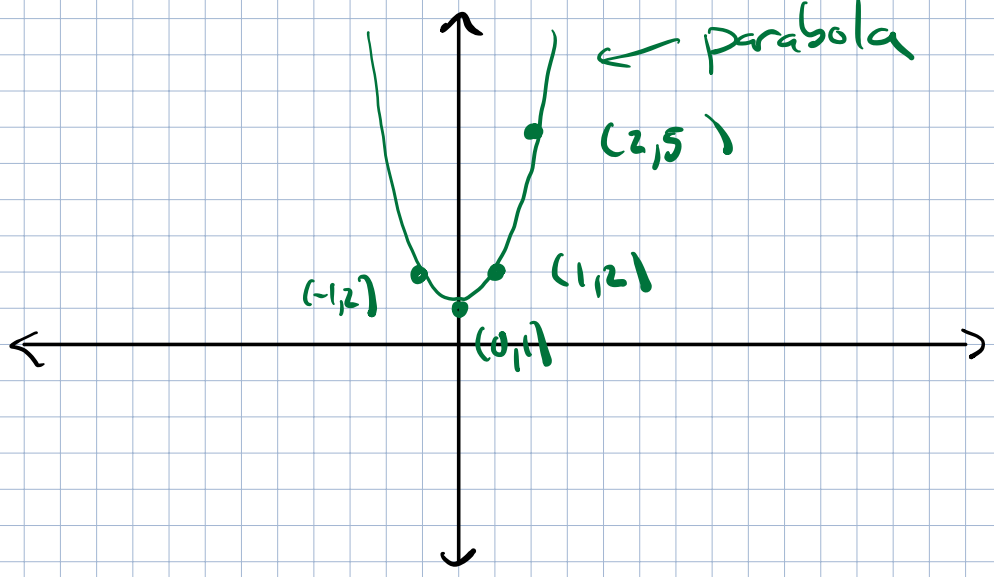


Quadratic Functions

$f(x) = a \cdot x^2 + b \cdot x + c$

ex: $f(x) = x^2 + 1$

x	f(x)
0	1
1	2
2	5
-1	2



Polynomials

A polynomial of degree d is a function of the form: $f(x) = a_d \cdot x^d + a_{d-1} \cdot x^{d-1} + \cdots + a_1 x + a_0$

Constant functions are polynomials of degree 0.

Linear " " " 1.

Quadratic " " " 2.

Rational Functions

A rational function is a function of the form:

$f(x) = \frac{P(x)}{Q(x)}$ where $P(x)$ and $Q(x)$ are both polynomials.

ex: $f(x) = \frac{x^2+1}{3x^3 - 7x^2 - 5}$