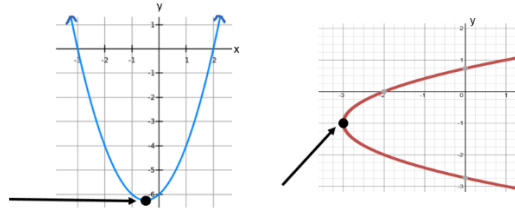


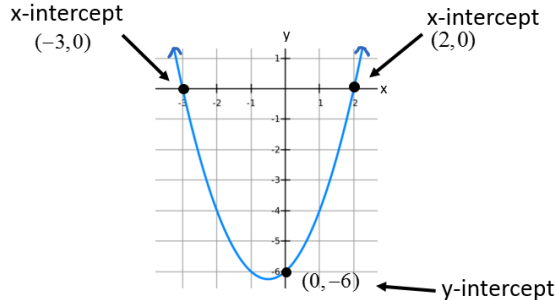
5C – Comparing Functions

❖ Vocabulary, Formulas, Theories:

- **Vertex:** the turning point of a parabola.



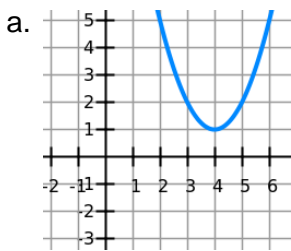
- **Intercepts:** the x-intercept is the point where the graph crosses the x-axis and the y-intercept is where the graph crosses the y-axis.



- **Input/Output Values of a Function:** the input value is what's plugged into a function to create an output value. For example, given $f(x) = 2x + 3$, the input is x and the output is $f(x)$, or y . If it is evaluated for a number, like 4, the equation would be written as $f(4) = 2(4) + 3 = 11$ where the input of 4 produces an output of 11.

📺 Video - ["Comparing Vertices - Example" - MathontheWeb \(3:41\)](#)

EX1) Determine the function that has the vertex with the smallest y value.



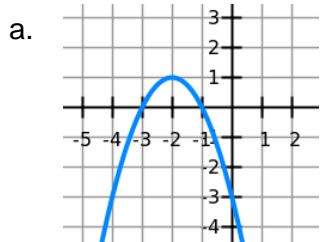
b. $y = x^2 - 4x$

c.

x	f(x)
-4	0
-3	3
-2	4
-1	3
0	0

📺 Video - ["Comparing Y-Intercepts - Example" - MathontheWeb \(4:26\)](#)

EX2) Determine the function that has the largest y-intercept.



b. $y = x^2 + x + 2$

c.

x	f(x)
-2	9
-1	3
0	-1
1	-3
2	-3
3	-1
4	3

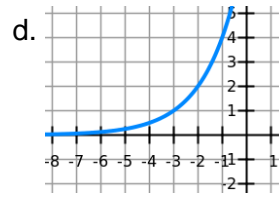
Video - "Input and Output Values - Example" - MathontheWeb (4:46)

EX3) Given an input value of $x = -3$, rank the output of the functions from least to greatest.

a. $y = 2x - 2$

b. $y = x^2 + 3x - 1$

c. $y = 3^{-x} + 2$



e.

x	f(x)
-5	-6.5
-4	-6.0
-3	-5.5
-2	-5
-1	-4.5

Video - "Comparing Functions - Example 1" - MathontheWeb (6:40)

EX4) Determine which table matches each of the given functions: $f(x)$, $g(x)$, and $h(x)$. Then fill in the missing table values.

$f(x) = -2x + 5$

$g(x) = -3(x-1)(x+5)$

$h(x) = 4^x$

Table A

x	y
-2	$1/16$
-1	?
0	1
1	4
2	16
3	64
4	?

Table B

x	y
-2	?
-1	?
0	5
1	3
2	1
3	-1
4	-3

Table C

x	y
-2	?
-1	24
0	15
1	0
2	-21
3	-48
4	?

Video - "Comparing Functions - Example 2" - MathontheWeb (13:39)

EX 5) Three vehicles leave a starting location at the same time. Each vehicle has an equation that represents the distance traveled where t is time in minutes and d is distance in miles.

- Fill in the chart with the range of distance (in miles) for the given interval of time (in minutes).
- Will the vehicles have traveled the same distance at any point of time? Explain why or why not.
- Over a long period of time, which vehicle travels the farthest? Which travels the shortest?

Vehicle	Equation for Distance ($d = \text{miles}; t = \text{minutes}$)
A	$d = 1.5t - 1$
B	$d = 0.5t^2$
C	$d = 0.5t$

Time Interval (minutes)	Vehicle A Range of Distances (miles)	Vehicle B Range of Distances (miles)	Vehicle C Range of Distances (miles)
$0 \leq t \leq 1$			
$1 \leq t \leq 2$			
$2 \leq t \leq 3$			
$3 \leq t \leq 4$			