Ex 2: Find $f(-2), f(-0.4), f(3.7), and\ f(5)$ for $f(x) = \begin{cases} -x & if\ x < 2 \\ 2x+3 & if\ 2 \le x < 4 \\ x^2 & if\ x \ge 4 \end{cases}$

x	Based on its domain, which rule will it follow	Evaluate $f(x)$	$f(x) =$
-2	$f(x) = -x$	$f(-2) = -{-2}$	2
-0.4		$f(-0.4) = -{-0.4}$	0.4
3.7	$f(x) = 2x+3$	$f(3.7) = 2(3.7)+3$	10.4
5	$f(x) = x^2$	$f(5) = 5^2$	25

Part 3: Graphing piecewise functions

Likewise, by paying attention to the domain, the graphs of piecewise functions can also be plotted according to the different functions that define them.

Ex 3:

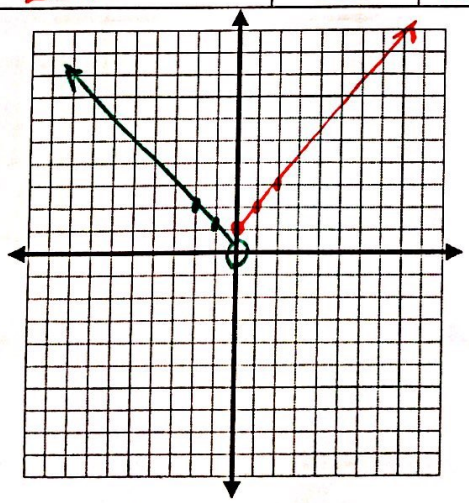
$$f(x) = \begin{cases} -x & if\ x < 0 \\ x+1 & if\ x \ge 0 \end{cases}$$

open when $x=0$

Closed when $x=0$

x	Evaluate $f(x)$	$f(x)$	Ordered Pair
-2	$f(-2) = -{-2}$	2	(-2, 2)
-1	$f(-1) = -{-1}$	1	(-1, 1)
0	$f(0) = -(0)$	0	(0, 0) open
	$f(0) = 0+1$	1	(0, 1)
1	$f(1) = 1+1$	2	(1, 2)
2	$f(2) = 2+1$	3	(2, 3)

Boundary value



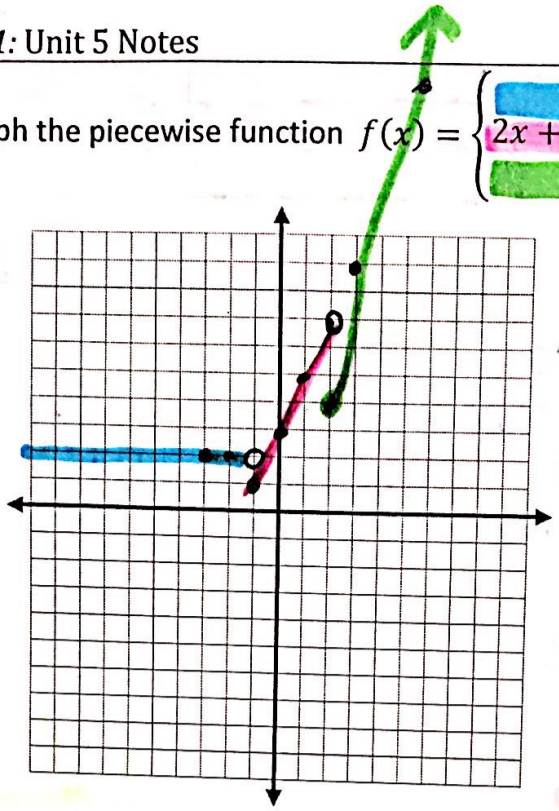
How to graph a piecewise function

1. Make a table of values. Make sure the boundary points are evaluated for each function.
2. Evaluate the piecewise function for each input; record as an ordered pair.
3. Plot the points on a coordinate plane. Connect the values from the same functions.
4. Between the different functions, be very aware of the domain. If the inequality sign is a greater than or less than and the point plotted is an end point, that point is ***open.*** If the inequality sign is a greater than or equal to (or less than or equal to), and it's on an end point, that end point is ***closed***

Ex 4: Graph the piecewise function $f(x) = \begin{cases} 2 & \text{if } x < -1 \\ 2x+3 & \text{if } -1 \le x < 2 \\ x^2 & \text{if } x \ge 2 \end{cases}$

open: $>$ or $<$

closed: $\ge$ or $\le$



x	Evaluate $f(x)$ in appropriate function		$f(x)$	Ordered pair
-3			2	(-3, 2)
-2			2	(-2, 2)
-1	$f(-1) = 2$ open dot	$f(-1) = 2(-1)+3 = 1$ closed		(-1, 2) (-1, 1)
0			3	(0, 3)
1			5	(1, 5)
2	$f(2) = 2(2)+3 = 7$ open	$f(2) = 2^2 = 4$ closed		(2, 7) (2, 4)
3			9	(3, 9)
4			16	(4, 16)

You Try Example

Ex 5: $f(x) = \begin{cases} -x-1 & \text{if } x < 0 \\ 1 & \text{if } 0 \le x < 2 \\ 2x+5 & \text{if } x \ge 2 \end{cases}$

x	Evaluate $f(x)$	$f(x)$	Ordered Pair
-3			
-2			
-1			
0			
1			
2			
3