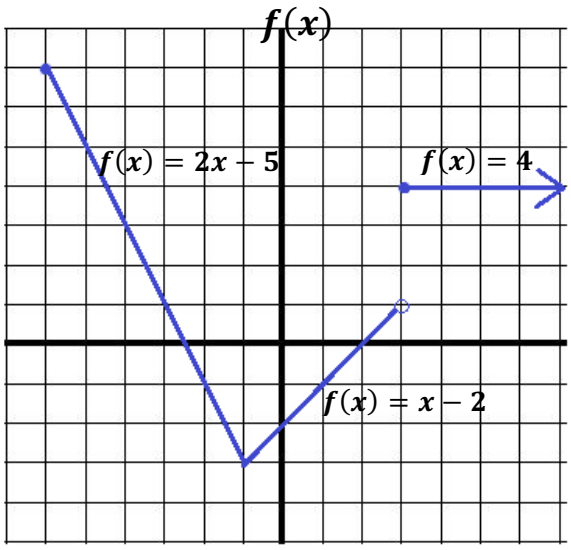
UNIT 6B - STUDY GUIDE – PIECEWISE FUNCTIONS

Piecewise Linear Function- is a function defined by at least two equations ("pieces"), each of which applies to a different part of the domain

$$f(x) = \begin{cases} 2x - 5 & if \quad -6 \le x < -1 \\ x - 2 & if \quad -1 \le x < 3 \\ 4 & if \quad x \ge 3 \end{cases}$$



$f(x) = 2x - 5 \quad if \quad -6 \le x < -1$

	x	y
Closed circle	-6	7
	-5	5
	-4	3
	-3	1
	-2	-1
Open circle	-1	-3

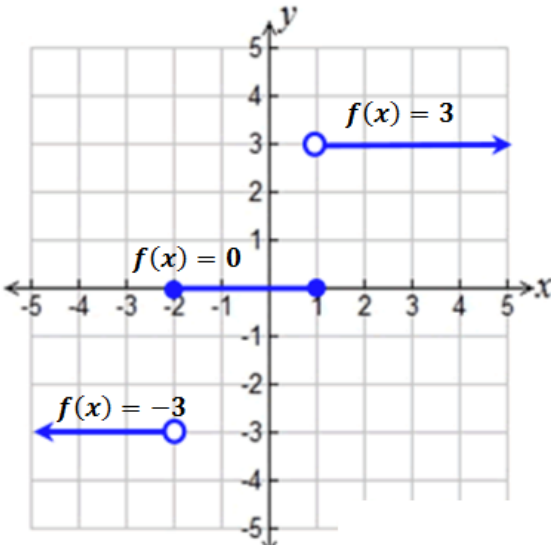
$f(x) = x - 2 \quad if \quad -1 \le x < 3$

	x	y
Closed circle	-1	-3
	0	-2
	1	-1
	2	0
Open circle	3	1

$f(x) = 4 \quad if \quad x \ge 3$

	x	y
Closed circle	3	3
	4	3
	5	3
	6	3
	7	3
	8	3

A Step Function- is a type of piece-wise linear functions which resembles sets of stair steps.
A step function (or staircase function) is a piecewise function containing all constant "pieces".



$$f(x) = \begin{cases} -3; & x < -2 \\ 0; & -2 \le x \le 1 \\ 3; & x > 1 \end{cases}$$

TRANSFORMATION RULES

Translation (Shift) Rules for $f(x)$ graph	
$f(x) + k$	Up k units
$f(x) - k$	Down k units
$f(x + h)$	Left h units
$f(x - h)$	Right h units

Dilation Rules for $f(x)$ graph	
$af(x)$ when $a > 1$	Narrower-Stretched Vertically
$af(x)$ when $0 < a < 1$	Wider-Stretched Horizontally

Reflection Rules for $f(x)$ graph	
$-f(x)$	Reflection in the x-axis
$f(-x)$	Reflection in the y-axis

Calculator Steps to Determine the Point(s) Of Intersection

Step 1	Press the Y= Key
Step 2	Enter the 1st equation into Y1
Step 3	Enter the 2nd equation into Y2
Step 4	2nd Trace (Calc menu)
Step 5	Press the #5 key(intersect)
Step 6	• Use left & right arrows to get close to the P.O.I. • Hit enter three times.
Step 7	• Repeat Steps 4,5 & 6 to determine the 2nd P.O.I. • The P.O.I's (solutions) should be written in (x, y) form.

Calculator strategy: You can also check the table of values to see if any points are in common. Look for the same y-values. This will only work for integers & not decimals.