

Graphing Piecewise Functions

★ Single Constraint = arrow on 1 end ★ Double constraint = NO arrows

#s 1-5: Graph the following

* $f(x) = y$ * Do Not put constraints in $y =$ when getting the table #'s from the calculator

1) * Constraint #'s must be the 1st or last # in the table

$f(x) = \begin{cases} 2x+4, & \text{if } x < -1 \\ -x+3, & \text{if } x \geq -1 \end{cases}$ calc: 2nd MATH to get symbol

$f(x) = 2x+4, \text{ if } x < -1$

$f(x) = -x+3, \text{ if } x \geq -1$

★ Constraint #'s must be 1st or last # in table (must include in table)

x	f(x)
-7	-10
-6	-8
-5	-6
-4	-4
-3	-2
-2	0

Chose these #'s b/c they are less than -1

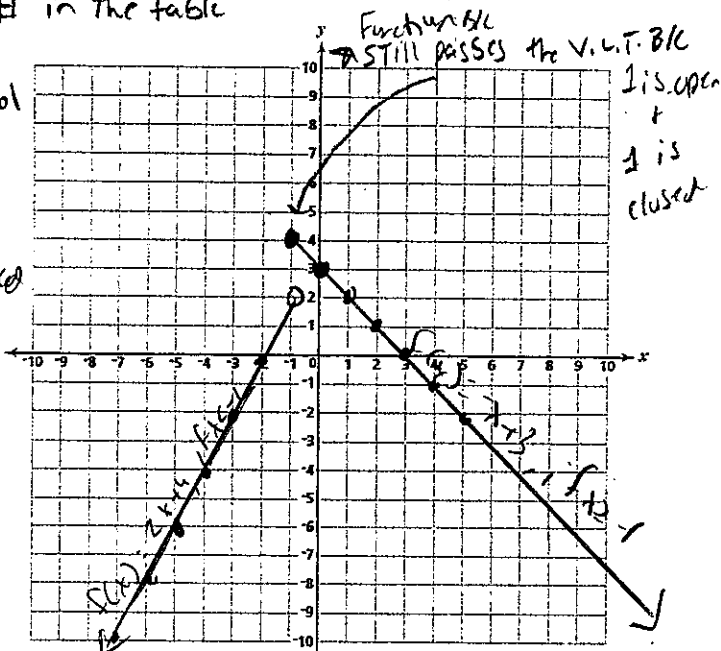
-1	2
----	---

open b/c of <

x	f(x)
-1	4
0	3
1	2
2	1
3	0
4	-1
5	-2

closed b/c of \geq

Chose these #'s b/c they are more than -1



$f(-4) = 4$ $f(-1) = 4$ $f(3) = 0$
 $f(-2) = 0$ $f(0) = 3$

2) * Include constraint #'s in the table

$f(x) = \begin{cases} -2x, & \text{if } x \leq 1 \\ x-4, & \text{if } x > 1 \end{cases}$

$f(x) = -2x, \text{ if } x \leq 1$

$f(x) = x-4, \text{ if } x > 1$

x	f(x)
-5	10
-4	8
-3	6
-2	4
-1	2
0	0

these #'s are less than 1

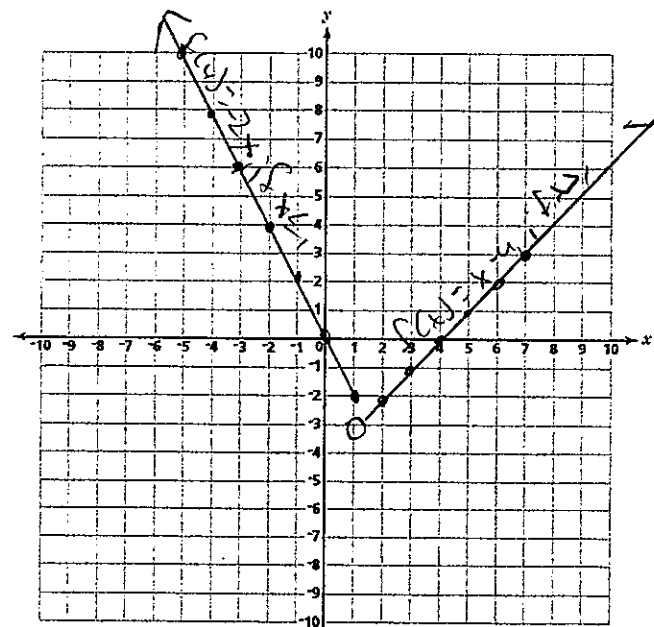
1	-2
---	----

closed b/c of \leq

x	f(x)
1	-3
2	-2
3	-1
4	0
5	1
6	2
7	3

these #'s are more than 1

open b/c of >



★ Function still passes the V.L.T.

3)

$$f(x) = \begin{cases} -x & \text{if } x \leq 2 \\ x & \text{if } x > 2 \end{cases}$$

$$f(x) = -x \text{ if } x \leq 2$$

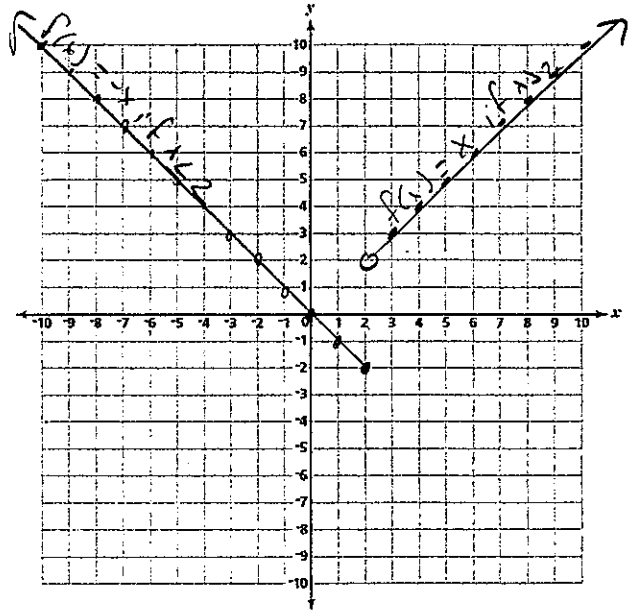
x	f(x)
-4	4
-3	3
-2	2
-1	1
0	0
1	-1

$$f(x) = x \text{ if } x > 2$$

x	f(x)
2	2
3	3
4	4
5	5
6	6
7	7
8	8

open & b/c of >

& closed (2, -2) b/c of <=



4)

$$f(x) = \begin{cases} 2, & x > -3 \\ -5, & x < -3 \end{cases}$$

$$f(x) = 2, x > -3$$

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

open & b/c of >

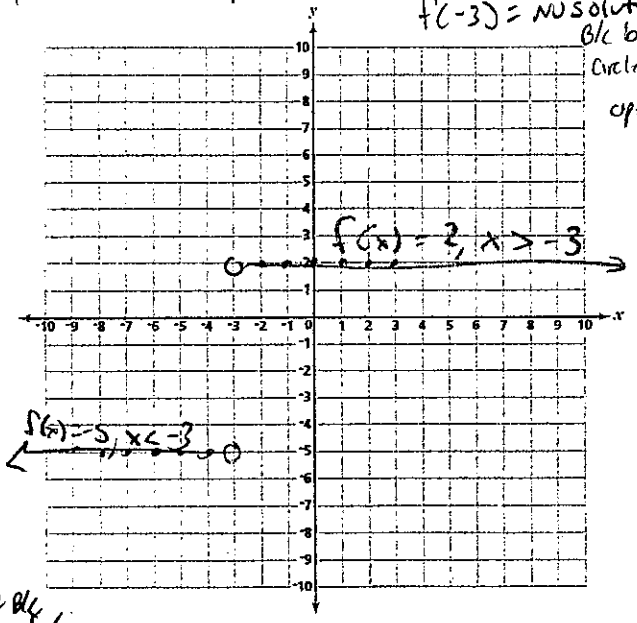
$$f(x) = -5, x < -3$$

x	f(x)
-9	-5
-8	-5
-7	-5
-6	-5
-5	-5
-4	-5

(-3, -5) open & b/c of <

Function b/c it passes the vertical line test

f(-3) = no solution b/c both circles are open



5)

$$f(x) = \begin{cases} x+4, & \text{if } -6 \leq x < 2 \rightarrow \text{Incalc: } (-6 \leq x)(x < 2) \\ -6, & \text{if } x = 2 \\ -x+2, & \text{if } x > 2 \end{cases}$$

$$f(x) = x+4, -6 \leq x < 2$$

x	f(x)
-6	-2
-5	-1
-4	0
-3	1
-2	2
-1	3
0	4
1	5
2	6

closed b/c of <=

$$f(x) = -6, x = 2$$

x	f(x)
2	-6

closed b/c of =

$$f(x) = -x+2, x > 2$$

x	f(x)
2	0
3	-1
4	-2
5	-3
6	-4
7	-5
8	-6

open & b/c of >

