Honors Math 2 — Piece-wise Functions — Name _____

I. Graph the following piece-wise functions on graph paper. Then, state the domain and range for each.

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

2. $f(x) = \begin{cases} x, & -4 \le x < 0 \\ 1, & x = 0 \\ 3x, & x > 0 \end{cases}$

See Graphs

3. $f(x) = \begin{cases} 4x, & 0 \le x < 2 \\ -2x + 10, & 2 \le x < 5 \\ 2, & 5 \le x < 10 \end{cases}$

4. $f(x) = \begin{cases} x, & x \le 2 \\ 2x - 1, & x > 2 \end{cases}$

II. Applications of Piece-wise functions. Set up a piece-wise function and solve for the given variable.

5. The Yummy Candy Company can produce up to 100 candy bars at a cost of $1.50 per bar. If they make more than 100 bars at one time, their cost goes down to $1.10 per bar, after their first 100 bars are made.

a) Find a function that gives the cost of producing any number of candy bars. $f(x) = \begin{cases} \$1.50 & x \le 100 \\ .10 & x > 100 \end{cases}$

b) Find the cost for 75 bars. $1.50(75) = \$112.50$

c) Find the cost for producing 200 bars. $1.50(100) + 1.10(100) = \$260$

6. A museum charges $40 for a group of 10 or fewer people. A group of more than 10 people must, in addition to the $40, pay $2 per person for the number of people above 10. The maximum group size is 50.

a) Find a function, C = f(x), that represents the cost as a function of the number of people going to the museum. $C = f(x) \begin{cases} 40 & x \le 10 \\ 2(x-10)+40 & 10 < x \le 50 \end{cases}$

b) How much would it charge for a group of 8? $40

c) Group of 35 people?

$2(35-10)+40$

$2(25)+40$

$50+40$

$90

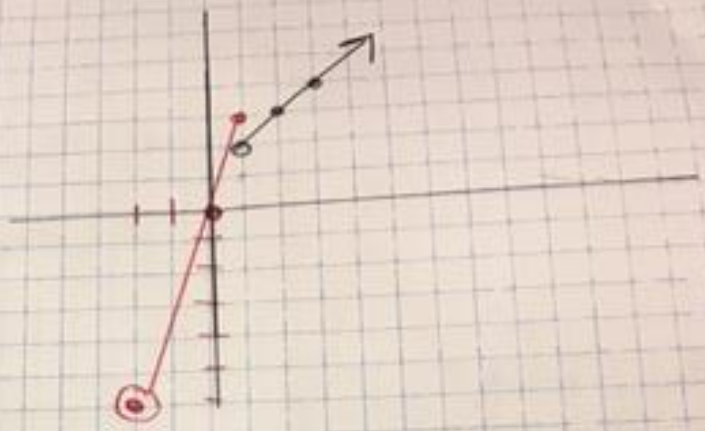
①

$3x$

x	y
−2	−6
0	0
1	3

$x+1$

x	y
1	2
2	3
3	4



②

x

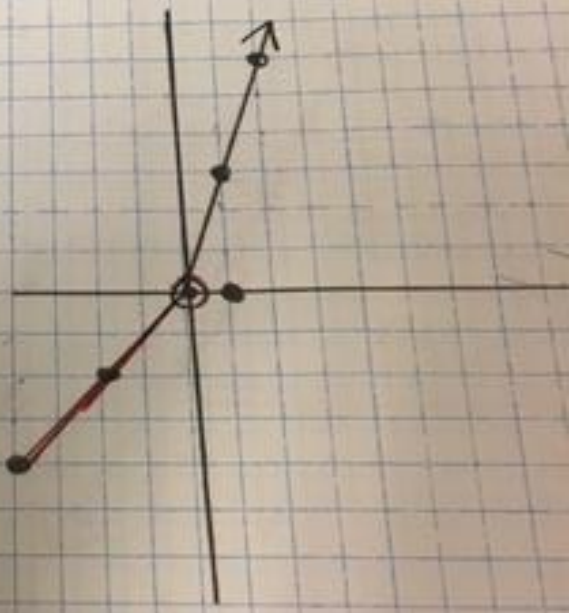
x	y
−4	−4
−2	−2
0	0

$x=0$

x	y
1	0

$3x$

x	y
0	0
1	3
2	6



③ $4x$

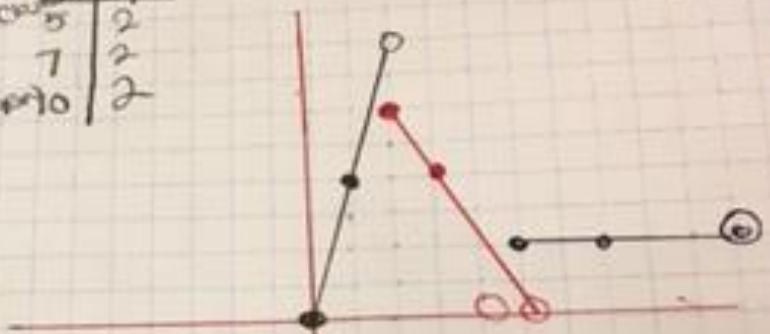
	x	y
closed	0	0
	1	4
open	2	8

$-2x+10$

	x	y
closed	2	6
	3	4
open	5	0

2

	x	y
closed	5	2
	7	2
open	10	2



④ x

	x	y
closed	2	2
	1	1
	0	0

$2x-1$

	x	y
open	2	3
	3	5
	4	7