Math 3

-Warmup on the sheet from Monday

3A

Is the inverse a function? NO
Explain: repeated x values

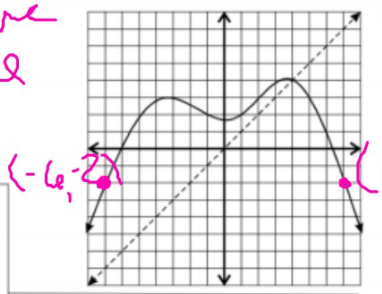
x	y
-2	4
0	0
1	1
2	4
3	9

$f^{-1}(x)$

x	y
4	-2
0	0
1	1
4	2
9	3

3B

Is the inverse a function? NO
Explain: not one to one



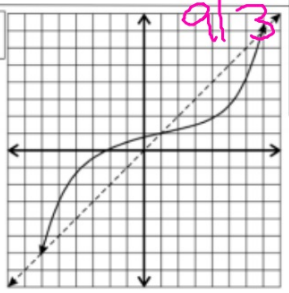
x	y
6	-2
-6	-2

x	y
-2	6
-2	-6

Station #3

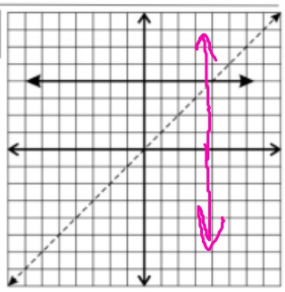
Determine whether the inverse is a function. Explain your answer. Use the dashed line y=x as a reference.

3C



Is the inverse a function? yes
Explain: one to one

3D

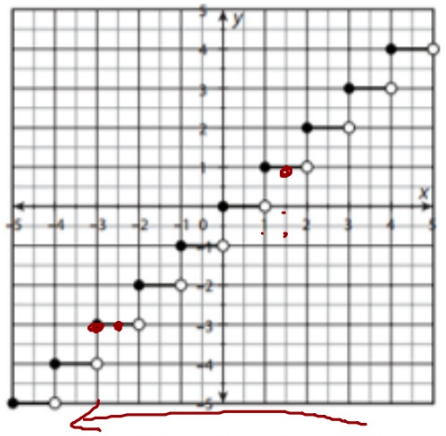


Is the inverse a function? no
Explain: repeating x values

NOTES UNIT 2.2

STEP FUNCTIONS	
Ceiling Function/Least Integer Function	Functions where for any input x, the output is the smallest integer greater than or equal to x. $\lceil x \rceil$
Discontinuous Function	A function that does not have a break in its graph across a specified domain.
Floor Function/ Greatest Integer Function	Functions where for any input x, the output is the largest integer less than or equal to x. $\lfloor x \rfloor$
Interval	A set of values between a lower bound and an upper bound.
Step Function/Stair Function	A function that is a series of disconnected constant functions

- The following graph displays a floor function, $y = \lfloor x \rfloor$.



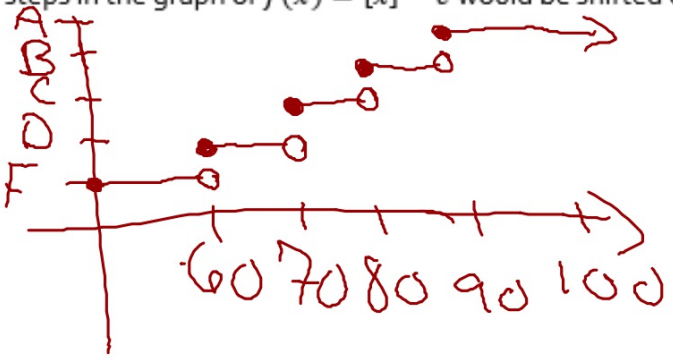
$y = \lfloor 1.5 \rfloor = 1$

$y = \lfloor -2.4 \rfloor = -3$

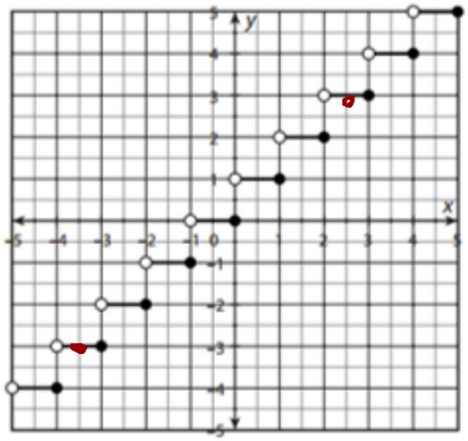
Domain: All real #'s

Range: integers

- Adding a constant to a floor function causes its graph to shift up or down depending on the sign of the function. For instance, for $f(x) = \lfloor x \rfloor + c$, adding c would shift the steps in the graph up by c units, while the steps in the graph of $f(x) = \lfloor x \rfloor - c$ would be shifted down by c units.



- The following graph displays a ceiling function, $y = \lceil x \rceil$.



$y = \lceil 2.67 \rceil = 3$

$y = \lceil -3.67 \rceil = -3$

Domain: All real #'s

Range: integers

Example 1:

Consider the least integer (ceiling) function, $g(x) = \lceil x \rceil$. How does the value *g(x)* change as *x* changes from 1.5 to 3.8? Graph the function to show the change.

1. Evaluate *g(x)* at *x=1.5*

$g(x) = \lceil 1.5 \rceil = 2$

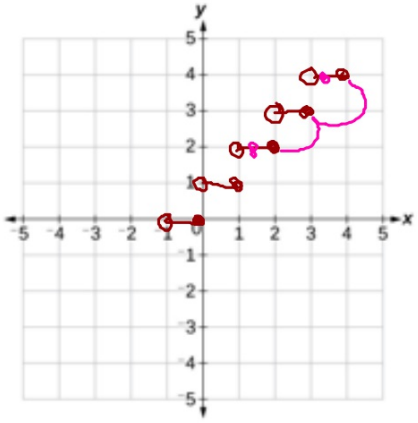
2. Evaluate *g(x)* at *x=3.8*

$g(x) = \lceil 3.8 \rceil = 4$

3. Determine how the value of *g(x)* changes as *x* changes from 1.5 to 3.8

$4 - 2 = 2$

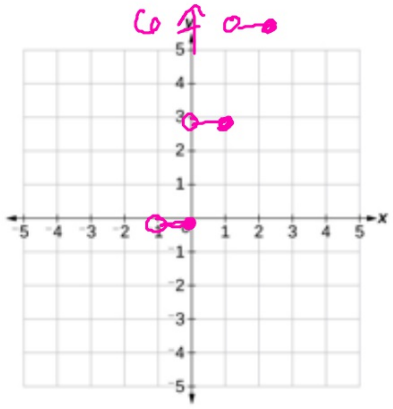
4. Graph the function *g(x)* to show this change.



$4 - 2 = 2$

Example 2:

Consider the function $f(x) = 3[x]$. Graph *f(x)* and identify the domain and any points of discontinuity for this function.



$f(x) = 3\lfloor .57 \rfloor = 3(0)$
$= 0$

$f(x) = 3\lfloor 1.17 \rfloor = 3(1)$
$= 3$

$f(x) = 3\lfloor 1.67 \rfloor = 3(2)$
$= 6$

- Identify the domain of *f(x)*

Domain: All Real #'s

- Identify any points of discontinuity for *f(x)*.

(0, 3), (1, 6)

Range: integers that are multiples of 3