

Greatest Integer Function

(10:14)

warm-up

(10:26)

Greatest Integer function

NOTES

The basic "floor" function is written

$f(x) = \lfloor x \rfloor$ $f(x) = \lfloor x \rfloor$ (notice bracket on bottom)

any value inside the full square brackets or bottom partial brackets gets rounded down to the nearest integer

the basic "ceiling" function is written $f(x) = \lceil x \rceil$. Any value inside the top partial brackets gets rounded up to the nearest integer

ex. $f(x) = \lfloor x \rfloor$

$f(2.3) = \lfloor 2.3 \rfloor \rightarrow f(2.3) = 2$ / $f(2.49) = \lfloor 2.49 \rfloor = 2$ / $f(2.5) = \lfloor 2.5 \rfloor = 2$

ex. $f(x) = \lceil x \rceil$

$f(2.3) = \lceil 2.3 \rceil = 3$ $f(2.8) = \lceil 2.8 \rceil = 3$

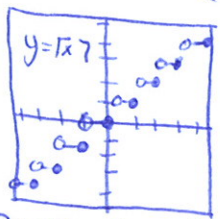
When graphed ...

- will create step functions.

- functions that have a slope of zero, which is a constant function.

The graph isn't continuous (cannot be drawn w/out lifting the pencil)

(Def.)



Domain = $x \in \{-\infty, \infty\}$
(all real #s)

Range = $y \in \{\dots, -3, -2, -1, 0, 1, 2, \dots\}$

To graph a greatest Integer function ...

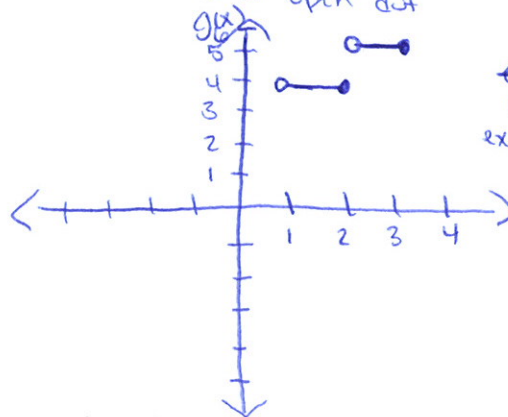
1. Make a table of intervals
2. Decide whether this is a "ceiling" or "floor" function
3. Compute a table
4. locate the starting point. Put a solid or open dot
5. Draw the "staircase"

Example 1

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

| x | g(x) |
|------|------|
| 1.3 | 4 |
| 1.4 | 4 |
| 1.49 | 4 |
| 2 | 4 |
| 2.1 | 6 |

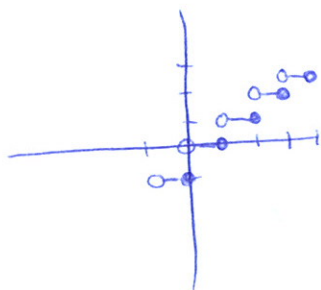
$g(1.3) = 2 \lceil 1.3 \rceil = 2(2) = 4$
 $g(1.4) = 2 \lceil 1.4 \rceil = 2(2) = 4$



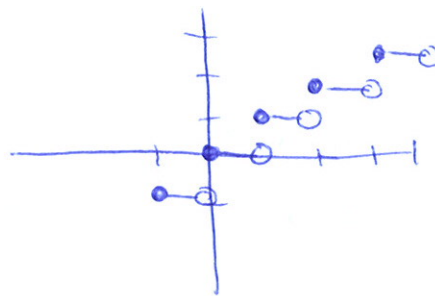
Open circle is not included in set.
ex. $(x=2)$ can only be a closed circle on one line, therefore it is open on other

when do "floor" function, dots will change but stairs will stay same...

ex.



Ceiling



floor

★
Home -
work

(3-2)

graph the following step functions using the steps outlined in class

~~graph the following step functions~~

$$y = \lceil x \rceil + 2$$

$$f(x) = -2 \lfloor x \rfloor + 1$$

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

Summary

Students learned about the greatest integer function and its two forms as a ceiling function and a floor function. They also learned how to graph these equations and which numbers are best to use.

Name:

Date:

Period:

Warm-up

~~Homework~~ Solve each equation or formula for the variable specified.

1. $3x - 4y = 7$, for x .

2. $15y + 1 = x$, for y .

3. $ex - 2y = 3z$, for x .

4. $\frac{3}{5}y + a = b$, for y .

5. $y = mx + b$, for m .

6. $\frac{by + 2}{3} = c$, for y .

7. $P = \frac{E^2}{R}$, for R .

8. $km + 5x = 6y$, for m .

9. $p(t + 1) = -2$, for t .

10. $\frac{3ax - n}{5} = -4$, for x .

