

2-6B Greatest Integer Functions

previous assignment:
Step Function Graphing Calculator

Greatest Integer Function: $f(x) = [x]$ means the greatest integer **less than or equal** to the value of x .

Other Step Functions: (not greatest integer functions)

- postage rates
- parking fees
- service fees - "a fraction there of"
- tax brackets

Examples: evaluate the following.

1. $[7.3]$

2. $[3.9]$

3. $[-2.4]$

Graphs

- consists of line segments, increasing in a step pattern.
- also known as step functions
- special type of piecewise function
- real life usually the opposite affect of greatest integer function.

$$y = a \llbracket bx + c \rrbracket + d$$

a: vertical distance = a

b: step length = $\frac{1}{b}$

c:

d: 3 vertical translation

$c+d = y_{\text{int}}$

Graph the following greatest integer functions.

1. $y = 2\lceil x \rceil + 1$

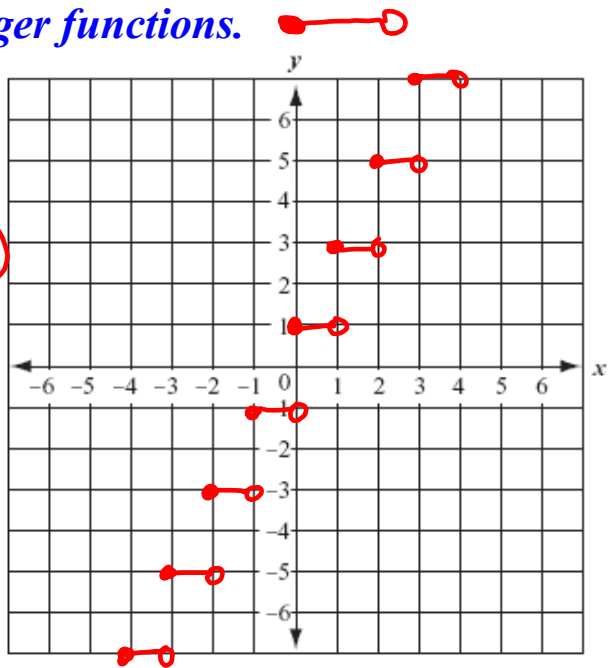
$a = 2$ (vertical distance)

$b = 1$ step length = 1

$c = 1$ (0, 1)

$D: \mathbb{R}$

$R: \text{odd integers}$



Graph the following greatest integer functions.

2. $f(x) = \lceil 2x + 1 \rceil$

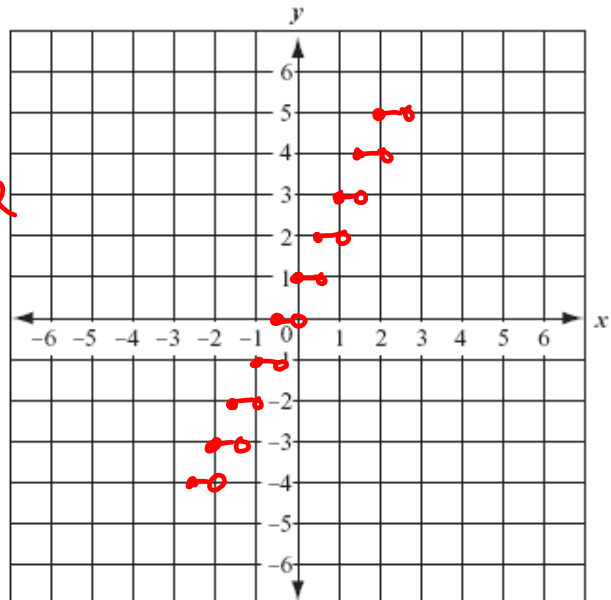
$a = 1$ vertical distance

$b = 2$ step length = $\frac{1}{2}$

$c = 1$ (0, 1)

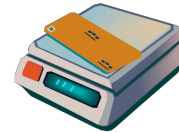
$D: \mathbb{R}$

$R: \text{all integers}$

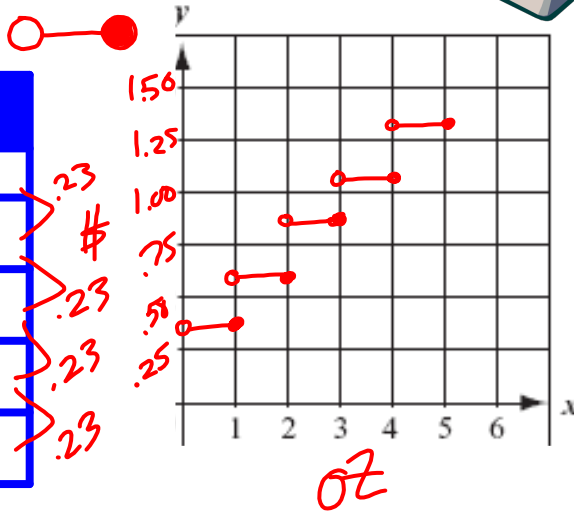


Real Life Graphing Example - postage rates

The following table gives the postage rate for the specific weight ranges. Graph the information from the table and use the graph to answer the following questions.



weight	mailing rate
up to 1 ounce $0 < x \leq 1$	\$.37
between 1 and 2 ounces $1 < x \leq 2$	\$.60
between 2 and 3 ounces	\$.83
between 3 and 4 ounces	\$1.06
between 4 and 5 ounces	\$1.29



D: $x > 0$
R: y starts at \$.37 and increases by \$.23

2-6B Worksheet