Section 1.3 *Translations of Parent Functions Step Function*

Objective: Given the parent functions of a step function students will be able to identify and graph rigid and non rigid transformations

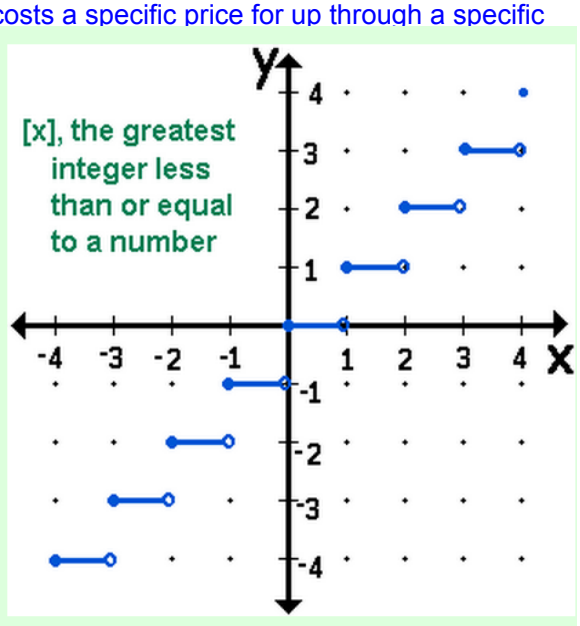
Vocabulary:

Greatest Integer Function: The function that assigns to each real number the greatest integer less than or equal to the number.

Example: US postage is sold by weight, a stamp costs a specific price for up through a specific weight.

$$y = [\![x]\!]$$

Round down



Example:

Evaluate (round down)

$[\![5\tfrac{3}{4}]\!] = 5$

$[\![3.1]\!] = 3$

$[\![0.1]\!] = 0$

$[\![-0.3]\!] = -1$

$[\![-1.5]\!] = -2$

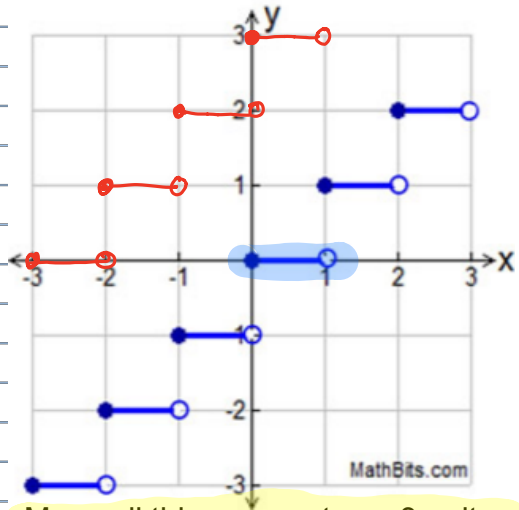
$[\![9.9]\!] = 9$

Example:

Describe the translations.

$y = [\![x]\!] + 3$

shift up 3 units

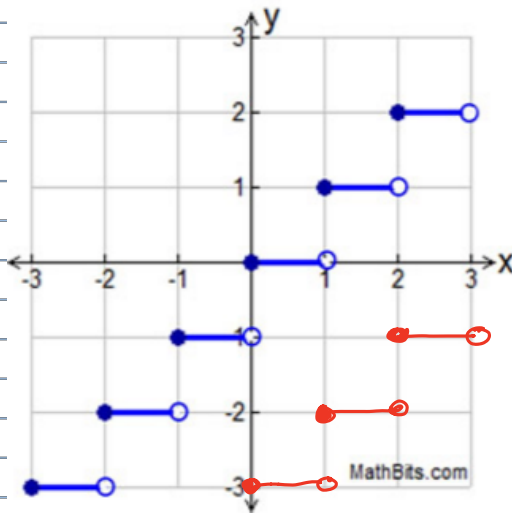


Move all this segments up 3 units

Example:

Describe the translations.

$$y = [\![x - 3]\!]$$

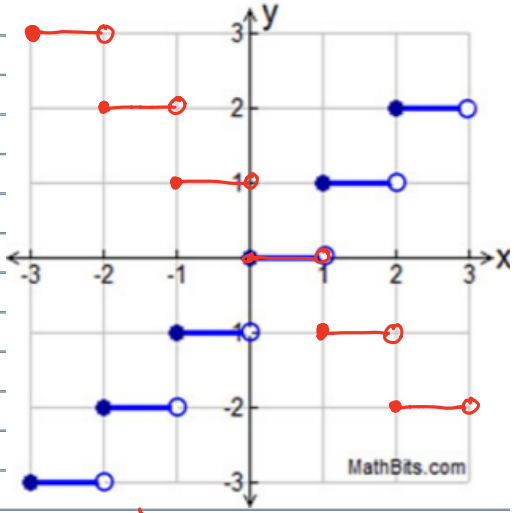


Move all this segments right 3 units

Example:

Describe the translations.

$$y = -[\![x]\!]$$

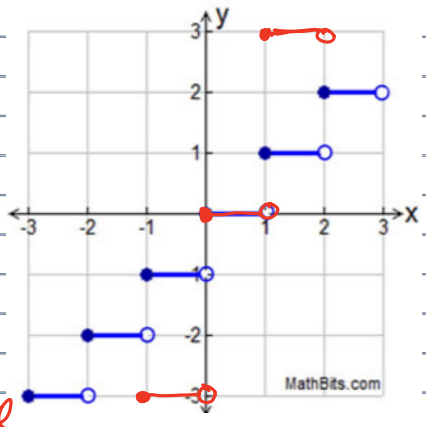


Reflect this segments across the x-axis

Example:

Describe the translations.

$y = 3[\![x]\!]$



Vertical

Stretch this segments 3 units

Think Pair Share

Let $f(x) = |x|$. Write the equation for the function resulting from a vertical shift of 3 units downward and a horizontal shift of 2 units to the right of the graph of $f(x)$.

f(x) = | x - 2 | - 3

Parent function is absolute value $f(x) = |x|$

function notation

y=f(x-2)-3