

Example 7

Graph the function below.

$$f(x) = \begin{cases} 3x & \text{if } 0 \leq x < 2 \\ 6 & \text{if } 2 < x \leq 4 \\ -x + 10 & \text{if } 4 < x \leq 6 \end{cases}$$

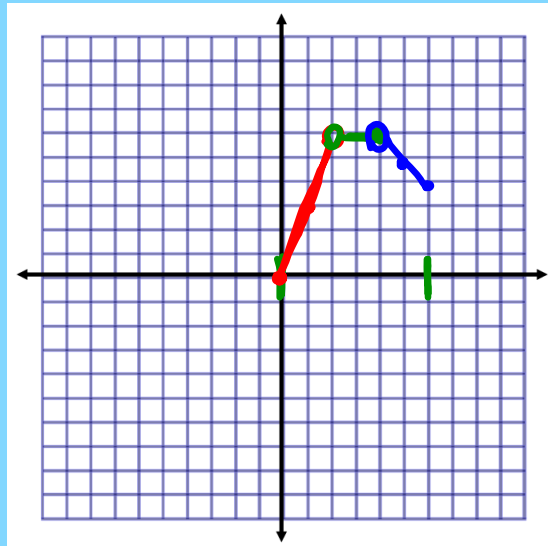
Handwritten notes: $3x$ is circled in red; 6 is circled in green with "horizontal" written next to it; $-x + 10$ is circled in blue.

x	y
0	0
1	3
2	6

Handwritten notes for the first table: "closed" next to (0,0), "open" next to (1,3), "open" next to (2,6).

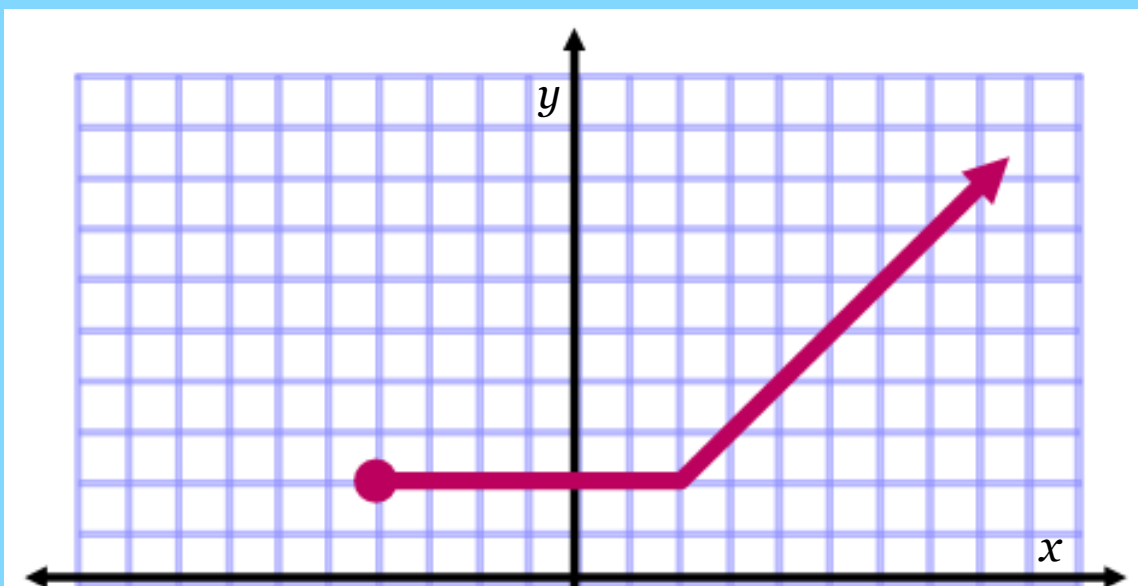
x	y
4	6
5	5
6	4

Handwritten notes for the second table: "open" next to (4,6), "closed" next to (6,4).



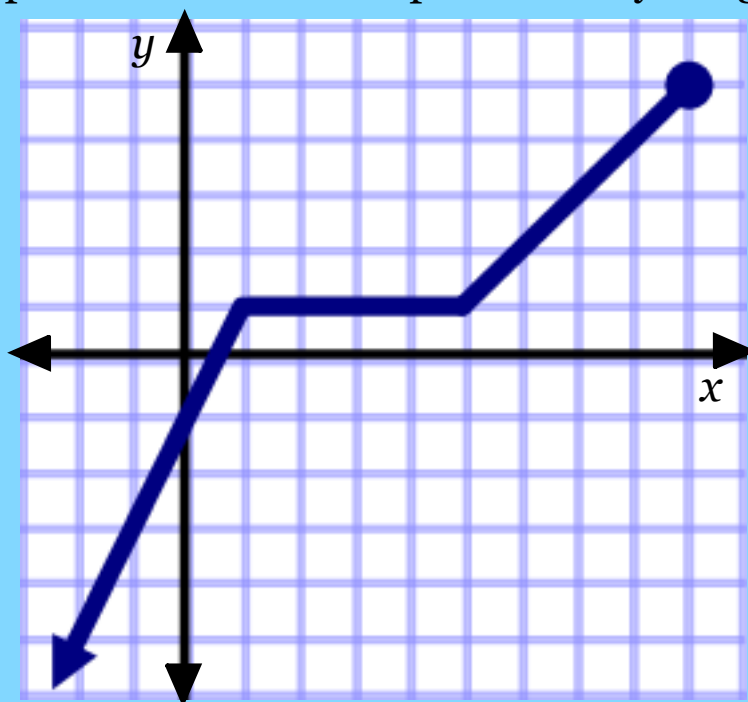
Example 8

Write the piecewise function represented by the graph below.



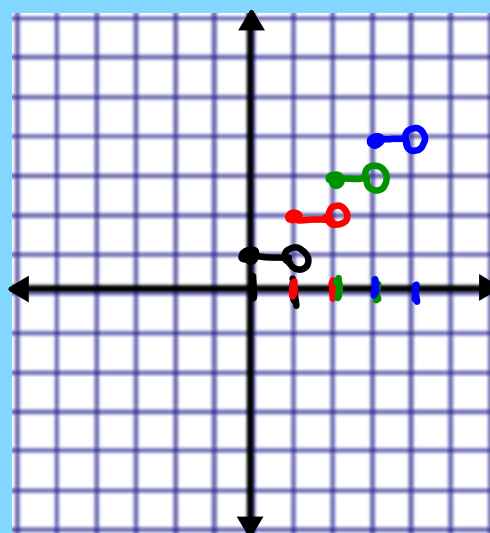
Example 9

Write the piecewise function represented by the graph below.

Example 10

Graph the function below.

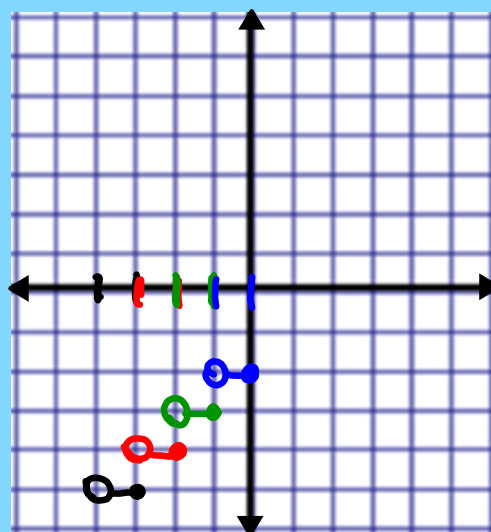
$$f(x) = \begin{cases} y = *1 & \text{if } 0 \leq x < 1 \\ y = *2 & \text{if } 1 \leq x < 2 \\ y = *3 & \text{if } 2 \leq x < 3 \\ y = *4 & \text{if } 3 \leq x < 4 \end{cases}$$



Example 11

Graph the function below.

$$f(x) = \begin{cases} -5 & \text{if } -4 < x \leq -3 \\ -4 & \text{if } -3 < x \leq -2 \\ -3 & \text{if } -2 < x \leq -1 \\ -2 & \text{if } -1 < x \leq 0 \end{cases}$$

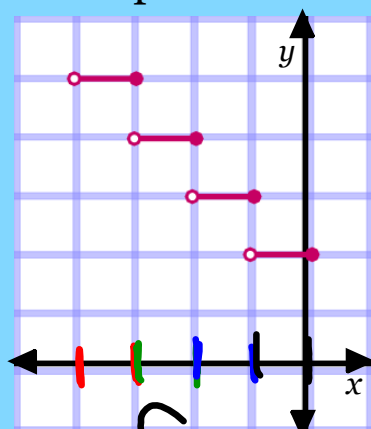


The function in the last two examples are called *step functions* because the graph represents a set of stairs.

Example 12

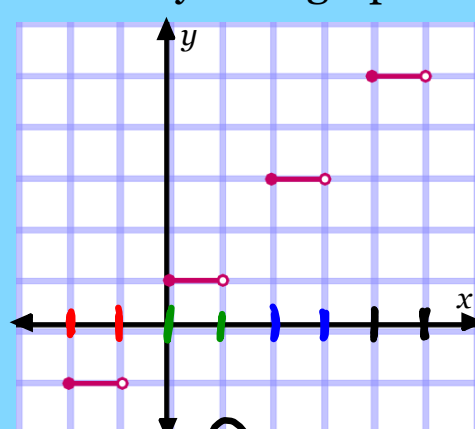
Write the piecewise function represented by each graph.

a)



$$f(x) = \begin{cases} 5 & \text{if } -4 < x \leq -3 \\ 4 & \text{if } -3 < x \leq -2 \\ 3 & \text{if } -2 < x \leq -1 \\ 2 & \text{if } -1 < x \leq 0 \end{cases}$$

b)



$$f(x) = \begin{cases} -1 & \text{if } -2 \leq x < 1 \\ 1 & \text{if } 0 \leq x < 1 \\ 3 & \text{if } 2 \leq x < 3 \\ 5 & \text{if } 4 \leq x < 5 \end{cases}$$