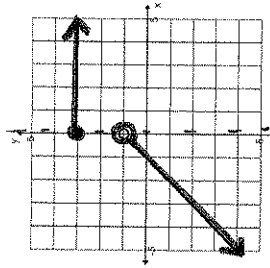


Piecewise Functions

What is a Piecewise Function?

A piecewise function is defined by at least two different rules that apply to different parts of the domain.

Example: $f(x) = \begin{cases} x+1, & \text{if } x < 0 \\ 3, & \text{if } x \geq 0 \end{cases}$



Evaluating a Piecewise Function

To evaluate a piecewise function, substitute the value of x into the rule for the part of the domain that includes the value of x .

1) Find $f(1)$ 2) Find $f(-1)$

$$f(x) = \begin{cases} x+4, & \text{if } x \leq 2 \\ 2x-1, & \text{if } x > 2 \end{cases}$$

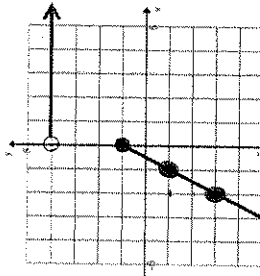
$$f(1) = 1+4 = \boxed{5}$$

$$f(-1) = 4(-1) + 2 = \boxed{-2}$$

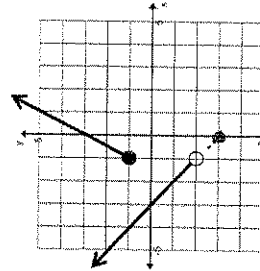
Writing a Piecewise Function

Linear Functions: $y = mx + b$

Write the equation for each function whose graph is shown.



$$f(x) = \begin{cases} 2x+1, & \text{if } x \leq 0 \\ 4, & \text{if } x > 0 \end{cases}$$



$$f(x) = \begin{cases} -x-3, & \text{if } x < -1 \\ 3, & \text{if } -1 \leq x < 1 \\ 2x+3, & \text{if } x \geq 1 \end{cases}$$

Graphing a Piecewise Function

$$(1) + 2 = 3$$

$$-2(1) + 4 = 2$$

5) Graph

x	f(x) = $\begin{cases} x+2, & \text{if } x \leq 1 \\ -2x+4, & \text{if } x > 1 \end{cases}$	y
-2	-2+2	0
-1	-1+2	1
0	0+2	2
1	1+2	3
2	-2(2)+4	0
3	-2(3)+4	-2

