

Day 4: Piecewise Functions

Date _____

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Piecewise Functions

1) Functions that change for different domains are called _____.

2) To find the value of a piecewise function for a given x -value, first determine which _____ x belongs to, this means you have to look at the domain for each piece, and find the one that applies to the given x value.

For example, for the piecewise, $f(x) = \begin{cases} x + 1, & x < 0 \\ x^2, & x \geq 0 \end{cases}$

Find $f(2)$

What does $f(2)$ mean? _____

Determine which equation to use:

How do you know?

Now plug 2 in for x and solve

Given $f(x) = \begin{cases} x + 1, & -5 \leq x < -1 \\ x - 1, & -1 < x \leq 3 \\ 2x, & x > 3 \end{cases}$, find the following.

3) $f(-4)$

4) $f(0)$

5) $f(3)$

6) $f(18)$

7) $f(1)$

8) $f(-20)$

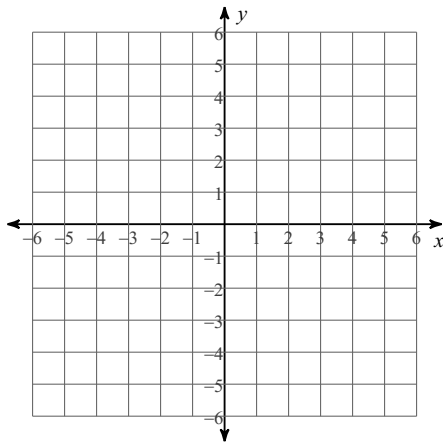
9) Before we begin with graphing a piecewise function, let's review how to graph a linear equation in the form of $y = mx + b$.

m represents the _____ which is _____.

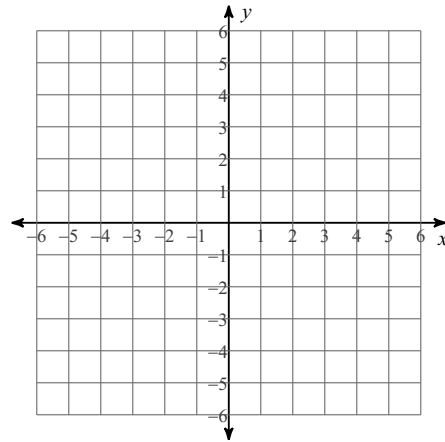
b represents the _____ and this is your _____.

Graph each linear equation.

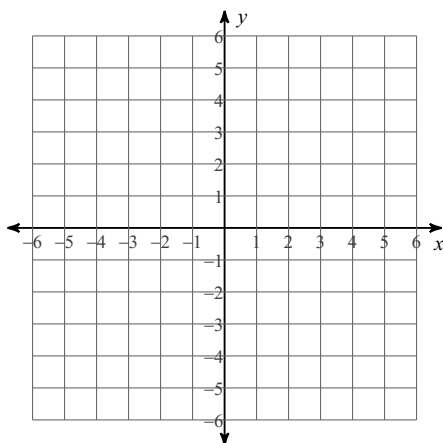
10) $y = x + 2$



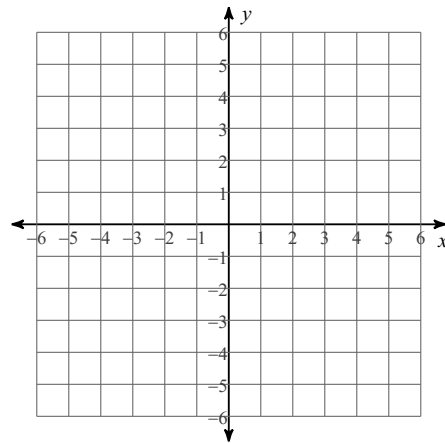
11) $y = -\frac{1}{4}x + 4$



12) $y = \frac{3}{4}x + 2$

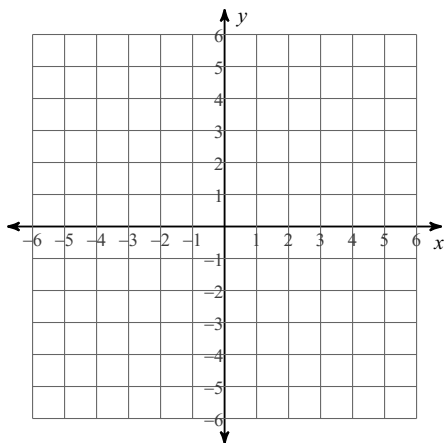


13) $y = -4$

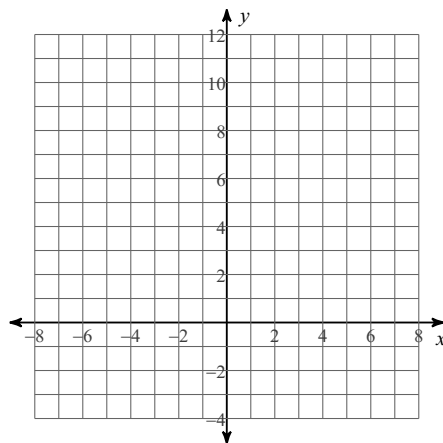


Graph the following piecewise functions.

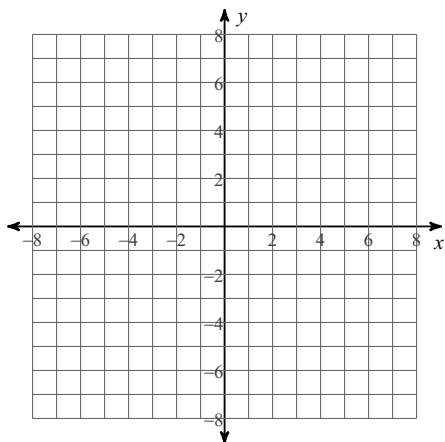
$$14) f(x) = \begin{cases} x + 1, & x < 0 \\ 2x - 5, & x \geq 0 \end{cases}$$



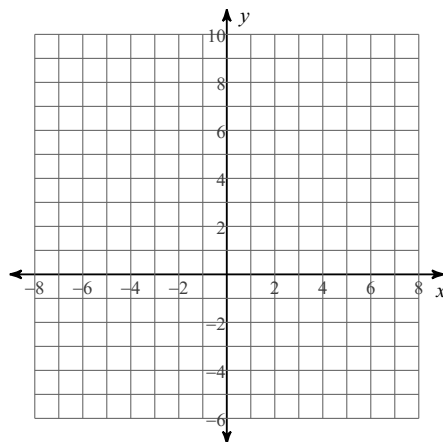
$$15) f(x) = \begin{cases} -2x + 4, & x < 0 \\ x + 4, & x \geq 0 \end{cases}$$



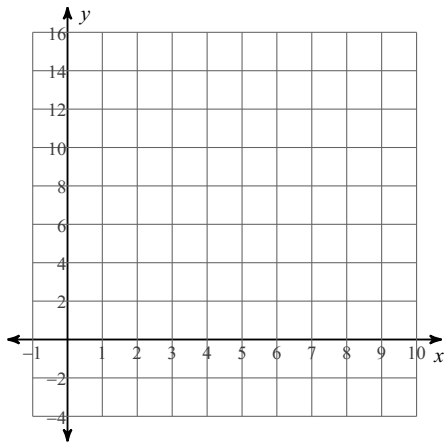
$$16) f(x) = \begin{cases} 3x - 4, & x < 0 \\ \frac{1}{2}x + 3, & x \geq 0 \end{cases}$$



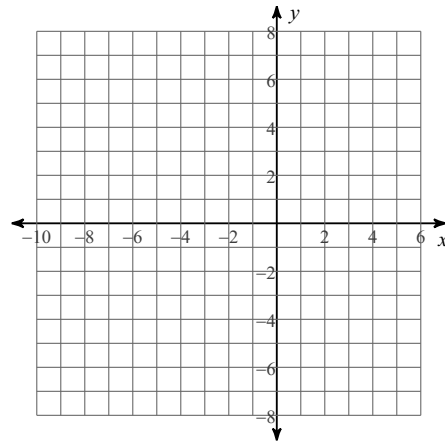
$$17) f(x) = \begin{cases} -x + 3, & x < 0 \\ x - 2, & x \geq 0 \end{cases}$$



$$18) f(x) = \begin{cases} x - 2, & 0 \leq x < 5 \\ 2x - 4, & 5 \leq x < 10 \end{cases}$$



$$19) f(x) = \begin{cases} -\frac{1}{3}x + 1, & -9 \leq x \leq -2 \\ 3, & -2 < x < 2 \\ \frac{1}{2}x - 3, & 2 \leq x < 6 \end{cases}$$



$$20) f(x) = \begin{cases} \frac{2}{3}x + 2, & x \leq -2 \\ -2, & -2 < x < 5 \\ \frac{1}{2}x, & x \geq 5 \end{cases}$$

