



Name _____ Period _____ Date _____

NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. Step Function

2. Domain

Short Answer:

3. How is an absolute value function a piecewise function?

4. How is the inverse of a function related to the function?

Review:

5. Solve by factoring: $2x^2 - 3x - 5 = 0$ 6. Solve: $3|x - 5| + 7 = 25$ 7. Solve the system:
$$\begin{aligned} y &= 2x + 5 \\ 3x - y &= -2 \end{aligned}$$

Problems:

Be sure to **show all work used to obtain your answer. Circle or box in the final answer.**8. If $f(3) = 7$ and g is the inverse of f , then $g(7) = ?$ _____9. Find the inverse of the function: $\{(3, -2), (8, 1), (0, 0), (2, 5), (-4, 7)\}$



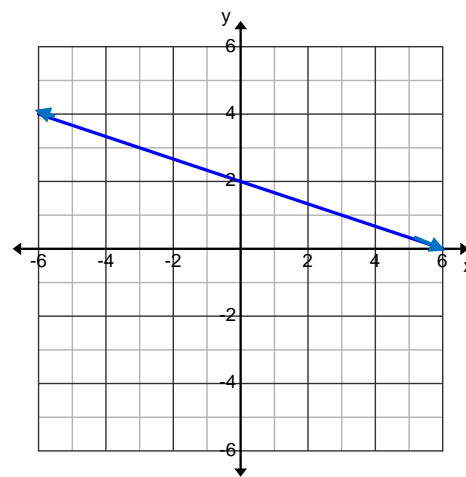
10. Find $f^{-1}(x)$ for the functions below. Show all work.

a. $f(x) = 2x - 5$

b. $f(x) = -\frac{1}{2}x + 1$

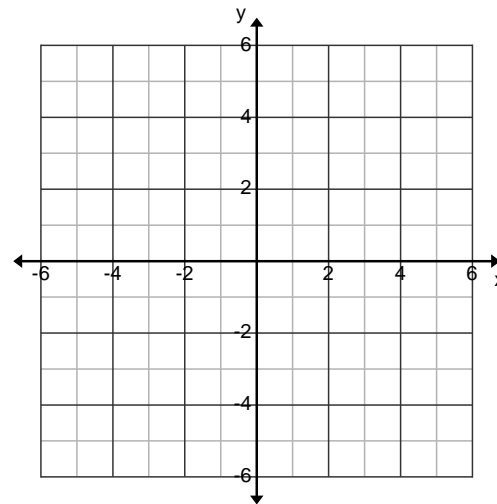
c. $f(x) = \frac{3}{4}x - 6$

11. Graph the inverse of the given function:



12. Find the inverse of the function. Then, graph the original function and its inverse on the graph at the right.

$f(x) = 4x - 6$



13. Evaluate the following for $f(x) = \begin{cases} 2|x-1|, & x \leq -1 \\ 4x+3, & -1 < x < 2 \\ 5, & x \geq 2 \end{cases}$

a. $f(0)$

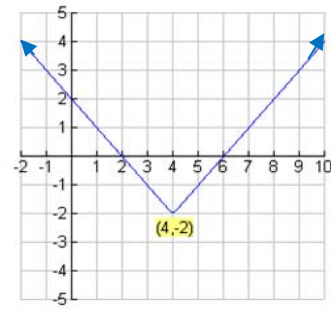
b. $f(-1)$

c. $f(8)$

d. $f(1)$



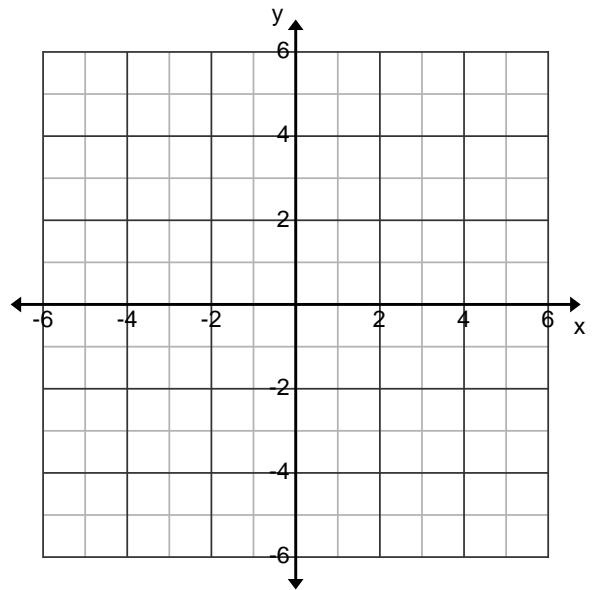
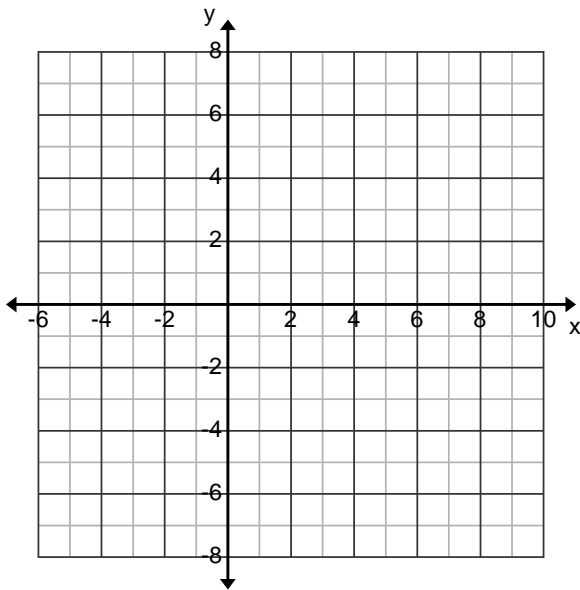
14. Write the equation for the graph shown at the right as a piece-wise defined function.



15. Graph the piecewise functions below:

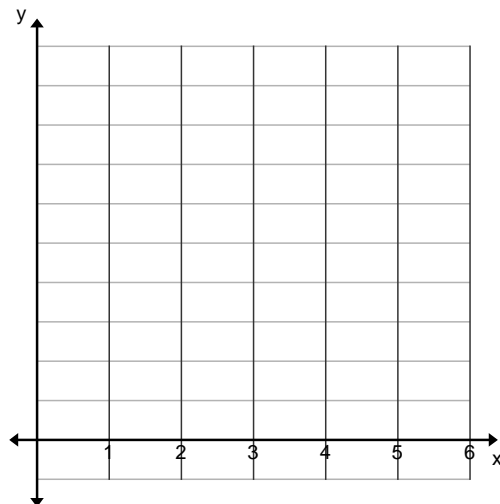
a. $f(x) = \begin{cases} 2x-1, & x \leq 2 \\ x-3, & x > 2 \end{cases}$

b. $f(x) = \begin{cases} x+1, & x \leq -1 \\ 3, & -1 < x \leq 2 \\ 2x-4, & x > 2 \end{cases}$



16. An automotive repair center charges \$50 for any part of the first hour of labor and \$35 for any part of each additional hour. Fill in the table below where x is the number of hours of labor and $T(x)$ is the total labor charge. Then, graph the function at the right.

x	$T(x)$
$0 < x \leq 1$	
$1 < x \leq 2$	
$2 < x \leq 3$	
$3 < x \leq 4$	
$4 < x \leq 5$	

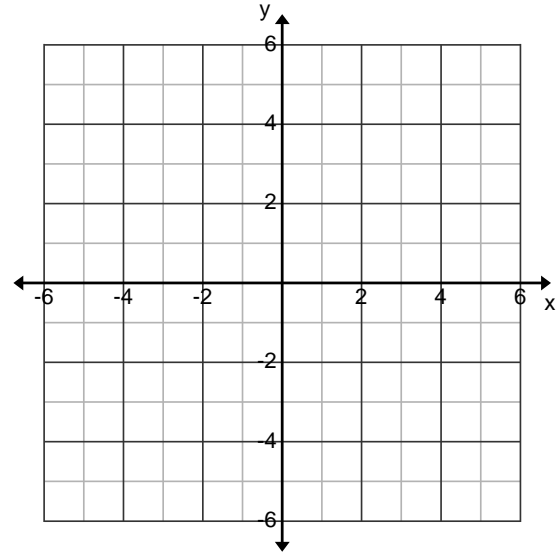
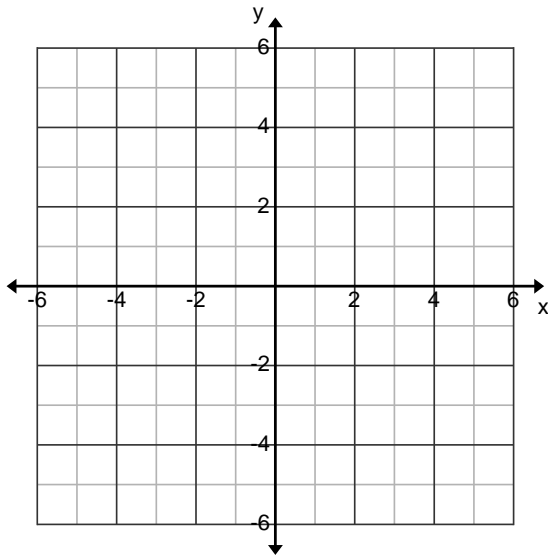




17. Graph the absolute value functions below.

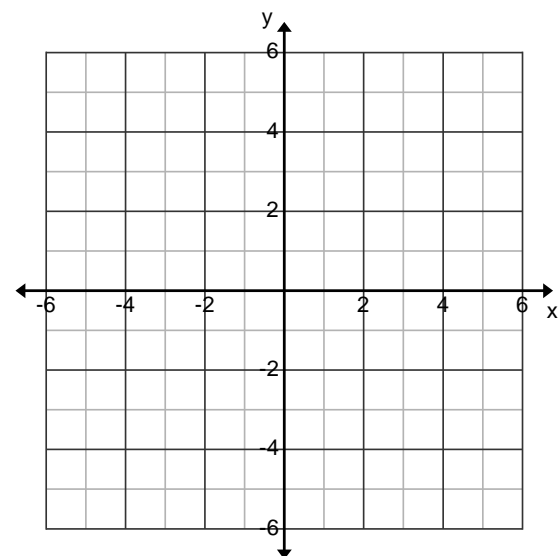
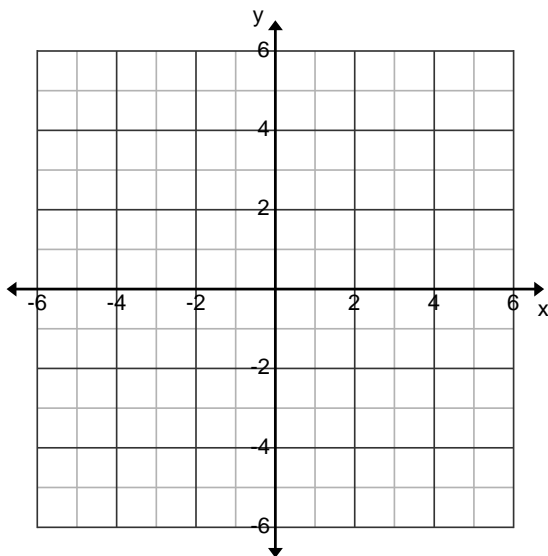
a. $f(x) = |x - 2| - 4$

b. $y = -|x + 2| + 3$



c. $y = 2|x + 1| - 1$

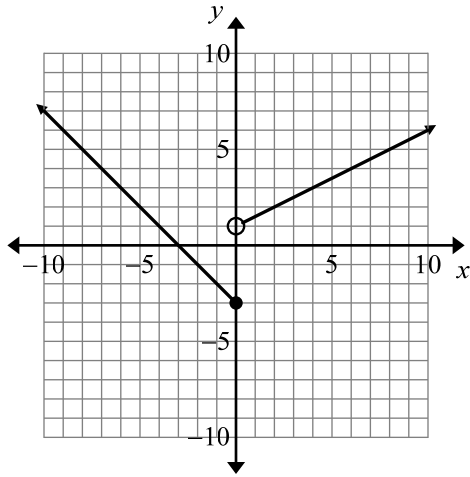
d. $y = \frac{1}{2}|x| - 4$





Multiple Choice Section: **Circle the best answer.**

18. Which function is represented by the graph?



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

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

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

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

19. A function $f(x)$ takes values of x and applies the following:

Step 1) divide x by 5

Step 2) subtract 3 from the result in Step 1

Which of these describes the inverse function of $f(x)$?

A. Step 1) multiply x by 5
Step 2) add 3 to the result in Step 1

C. Step 1) add 3 to x
Step 2) multiply the result in Step 1 by 5

B. Step 1) subtract 3 from x
Step 2) divide the result in Step 1 by 5

D. Step 1) divide x by $1/5$
Step 2) subtract -3 from the result in Step 1

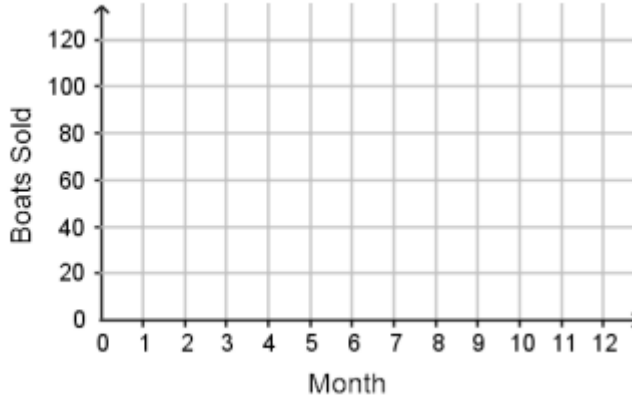


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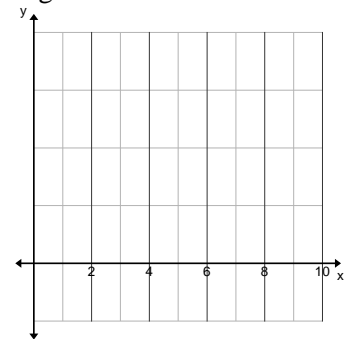
CALCULATOR SECTION

1. The number of boats, B , a boat dealer sells in each month of the year from March to December can be modeled by the function $B = -15|t - 5| + 120$, where t is the time in months and $t = 1$ represents January. Complete the table of values and then graph the function.

Time (months)	Boats Sold
3	
5	
7	
9	
11	
12	



- a. What is the maximum number of sales in one month? In what month is the maximum reached?
 - b. What is the minimum number of sales in one month? In what month is the minimum reached?
2. During a nine hour snowstorm, it snows at a rate of 1 inch per hour for the first two hours, at a rate of 2 inches per hour for the next six hours, and at a rate of 1 inch per hour for the final hour.
- a. Write and graph a piecewise function that gives the depth of the snow during the snowstorm.



- b. How many inches of snow accumulated from the storm?
3. The equation $f(x) = 2.3x + 61$ can be used to approximate height in centimeters when the length of a person's femur (thighbone) is known. Find $f^{-1}(x)$ and explain what it computes.