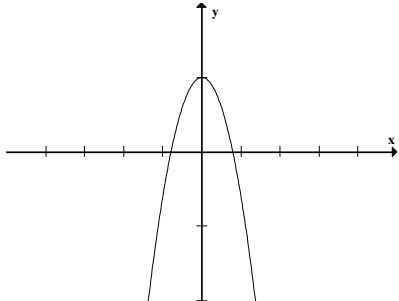


Pre-Calculus Unit 1 Practice Test

Complete the problems below and show your work.

Target 1A: I can identify functions from data tables, graphs, and descriptions of set relations.

1. Does the graph below represent a function? Explain.



2. Does the table represent a function? Explain why or why not.

x	4	1	-3	8	1
y	2	6	3	8	9

3. If $f(x) = -x^2 + 2$ evaluate

a. $f(2)$

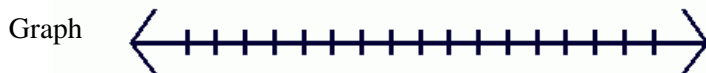
b. $f(-1)$

c. $f(3) - f(1)$

Target 1B: I can describe a set of numbers in a variety of ways.

For each of the following, fill in the missing type of interval or graph. Describe the interval as bounded, unbounded, open, closed, half-open.

4. Interval _____ Inequality $3 < x \leq 7$ _____



Description _____

5. Interval $(3, \infty)$ Inequality _____



Description _____

6. Interval _____ Inequality _____



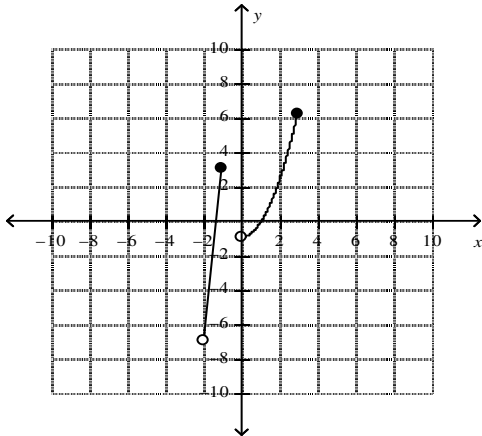
Description _____

7. Describe the set of numbers using interval notation.
 $x \geq 5$ or $x < 11$

8. Describe the set of numbers using set-builder notation.
 $\{-9, -8, -7, -6, -5, \dots\}$

9. Describe the domain and range of $y = \sqrt{x + 3}$ in interval notation.

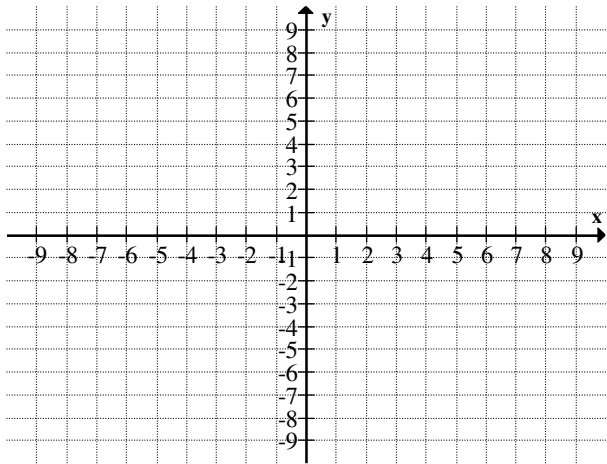
10. Use the graph below to find the domain and range.



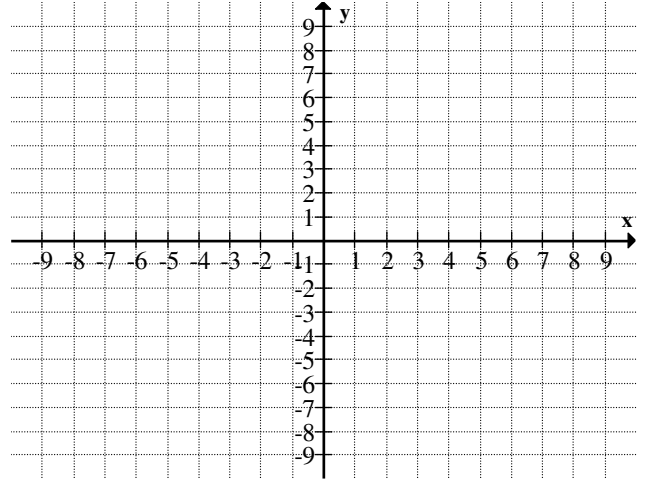
11. Find the domain and range of the relation $\{(-2, 4), (3, 5), (4, -2), (3, 8)\}$ and explain if it determines a function.

Target 1C: I can define, interpret, and use piecewise functions in function notation and as a graph.

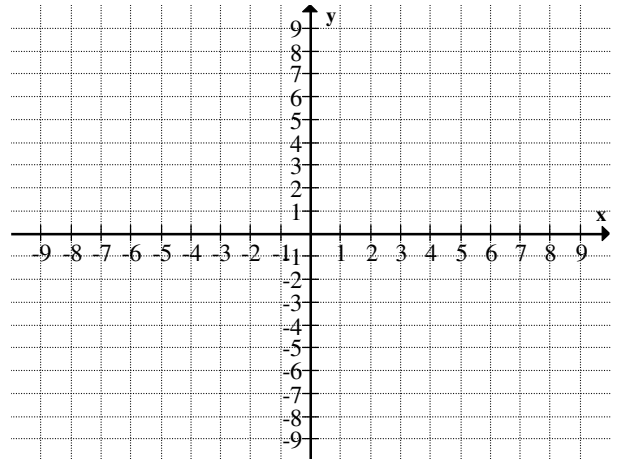
12. Graph $f(x) = \begin{cases} 2x + 1 & \text{if } x < 0 \\ 4x & \text{if } x \geq 0 \end{cases}$



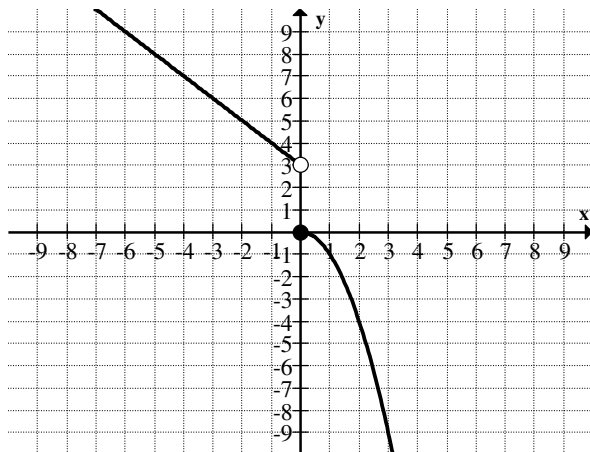
13. Graph $f(x) = \begin{cases} 3x - 1 & \text{if } x < -3 \\ x + 4 & \text{if } -3 \leq x < 2 \\ -2 & \text{if } x \geq 2 \end{cases}$



14. Graph $f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ 5x & \text{if } x \geq 0 \end{cases}$

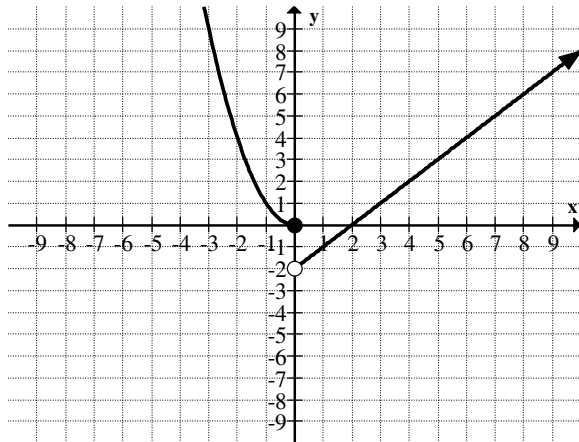


15. Write a piecewise function for the graph below.



16. Rewrite the function in the previous question so that the function would be continuous.

17. Write a piecewise function for the graph below.



18. Rewrite the function in question 6 so that the function would be continuous.

Target 1D: I can determine the average rate of change for a function as well as identify increasing and decreasing functions and intervals.

19. For which interval(s) is the function $y = 2x^3 - 8x + 5$ increasing and decreasing?

20. Find the extrema for $f(x) = -3x^3 + 8x^2 + 10x - 9$ name the specific type of extrema.

21. Graph the function $y = x^4 + 2x^3 + 3x$ on your calculator. Find the x-value of any extrema to the nearest hundredth and describe what type of extrema it is.

22. Find the average rate of change for $f(x) = x^3 - x^2$ on the following intervals.

a. $[0, 4]$

b. $[-4, -3]$

23. Find the average rate of change for $f(x) = x^2 + x$ on the following intervals.

a. $[1, 3]$

b. $[-4, -1]$

c. $[a, a + h]$

24. Find the average rate of change for the graph below on the interval $[-2, 0]$.

