

LESSON 7: An Introduction To Functions

- Input-Output Diagrams
- Definition of function
- Vertical line test
- Function notation
- Independent variable
- Dependent variable
- Argument of function
- Important facts about functions
- Definition of domain of function

Function: *noun*

- Nerdy definition: A **function** is a relation in which each input, or element in the domain of the relation, corresponds to exactly one output, or element in the range of the relation.
- Your version of definition: (rewrite this in your own words)

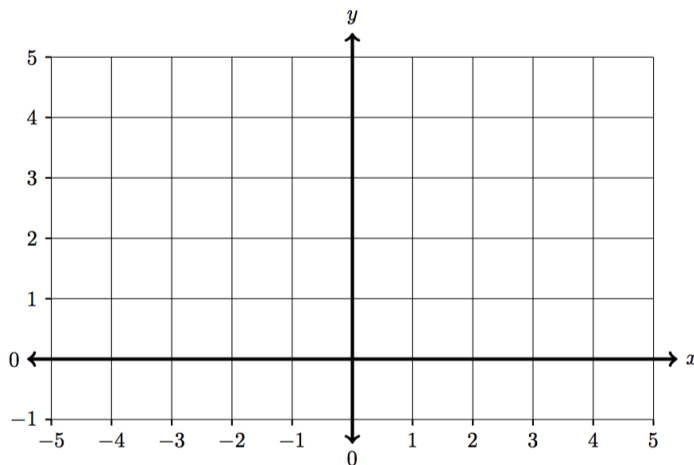
For problems 1 and 2 below, consider the given relationships. For each relationship:

- a. Draw an input-output diagram.
- b. Draw the points on an x- and y-axis.
- c. Determine whether each of the following is a function.

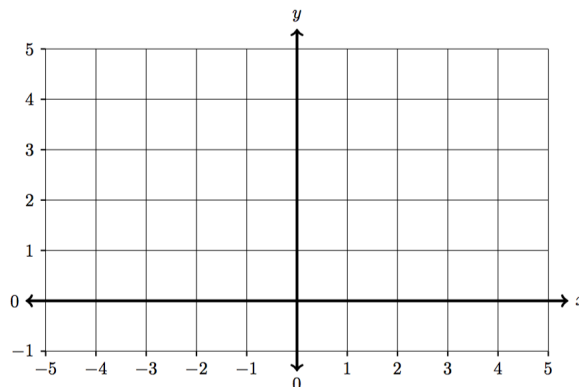
1. $\{(2, 3), (5, 3), (-2, 1), (0, 3)\}$

Draw input-output diagram

Graph on x- and y-axis:



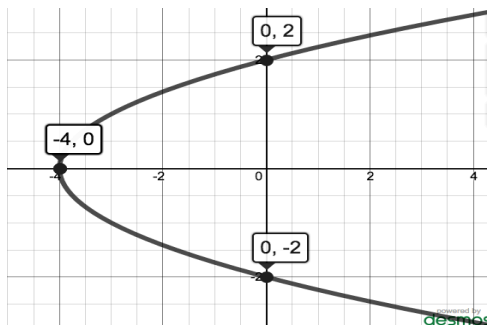
2. $\{(1,2), (2,3), (1,3), (4,5), (5,6)\}$

Draw input-output diagramGraph on x- and y-axis:

Lesson 7: Determining if a Relation Represents a Function

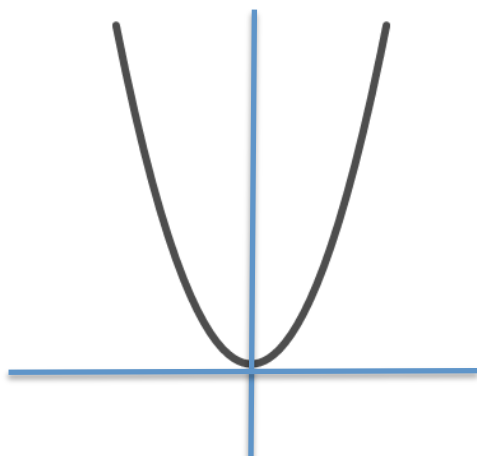
For problems 3, 4, 5, and 6, observe the given graph. Using this graph, determine whether the relationship displayed represents a function or not. Justify your answer.

3.



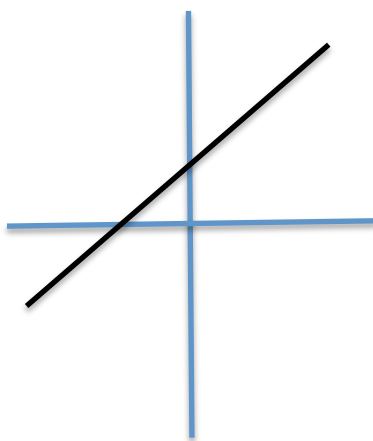
4.

Parabola



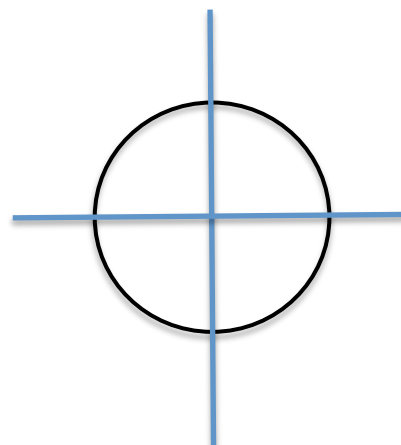
5.

Line



6.

Circle



LESSON 7: Finding Function Values

For problems 7 and 8 below, evaluate the given function at the given points.

7. Let $f(x) = \frac{x^2 - 25}{5 - x}$.

a. Find $f(2)$

b. Find $f(5)$

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8. Let $h(t) = -t - t^2$. Find

a. Find $h(2)$

b. Find $h(-3)$

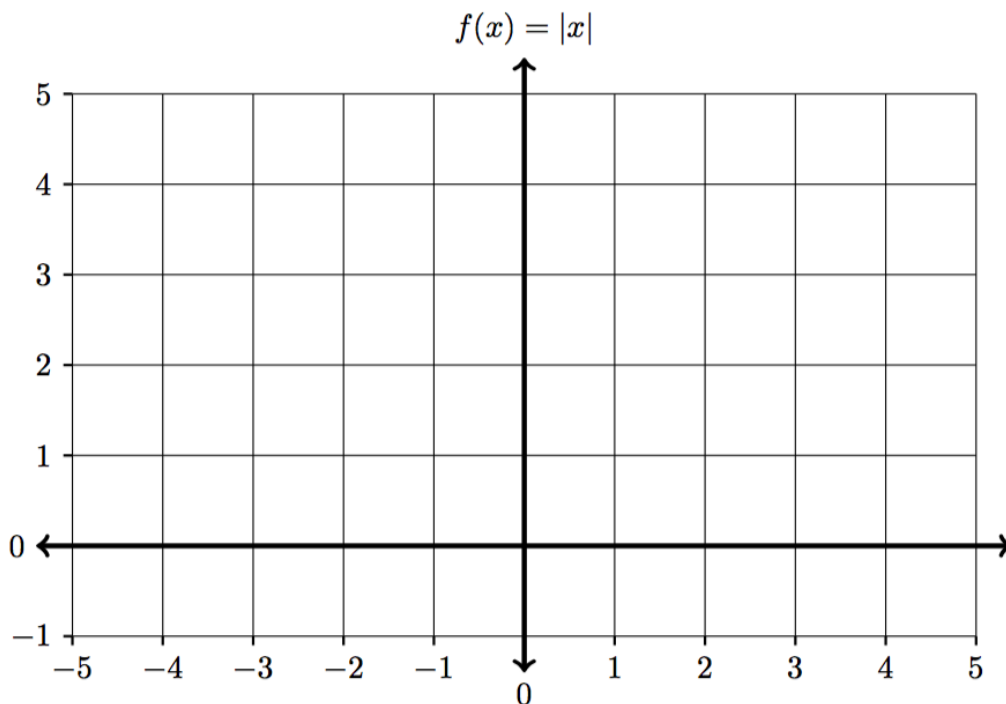
LESSON 7: Functions and Their Graphs

- Definition of the graph of a function
- The zero of a function
- Table of basic function graphs and properties

9. Forward Problem: Absolute Value Function Evaluation

- A. Fill in the table below
- B. Plot these points on the axis provided
- C. Interpolate between the points you plotted to create the graph of this function

x	$f(x) = x $
-5	
-4	
-3	
-2	
-1	
0	
1	
2	
3	
4	
5	



10. What is the x -intercept of this graph?

11. Why does the graph of the absolute value function never go below the line $y = 0$

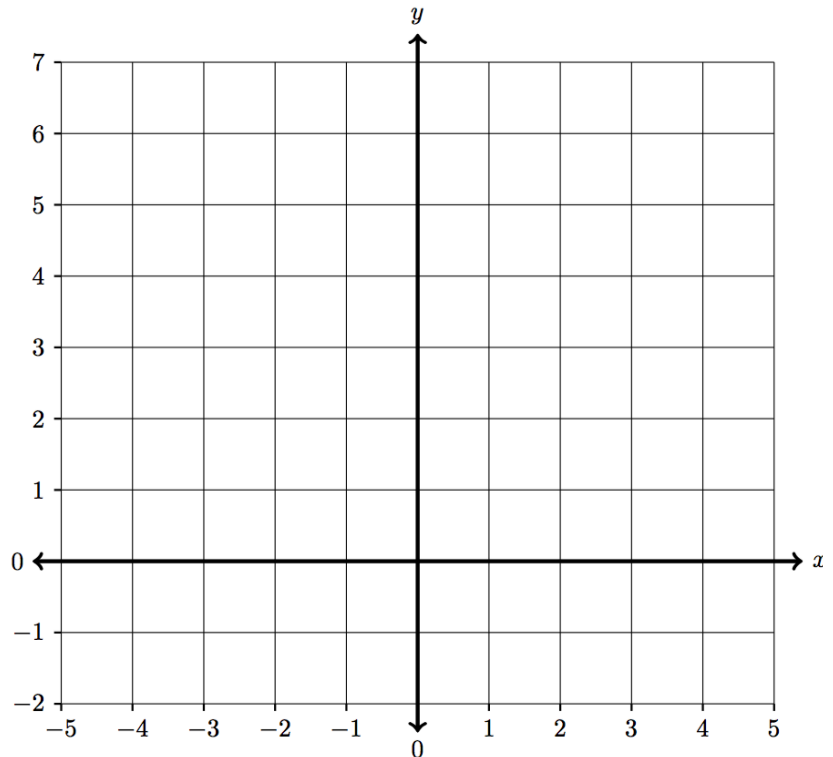
Graphical Technique to solve algebraic equations

To find the solution to algebraic equations using a graphical technique, use the following 5 steps:

- Step 1: Graph the function y_1 on the left-hand side of the equals sign.
 Step 2: Graph the function y_2 on the right-hand side of the equals sign.
 Step 3: Find the point(s) of intersection between the graphs of the two functions.
 Step 4: Write each point of intersection as an ordered pair in the form: (x, y)
 Step 5: Set the variable from the original algebraic equation equal to the 1st coordinate of each point of intersection. These “x”-values are the solution(s) to the algebraic equation.

12. Use a graphical technique to solve the equation $|x + 1| = 2 + \frac{1}{2}x$

x	$y_1 = x + 1 $	$y_2 = 2 + \frac{1}{2}x$
-5		
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		
5		



13. Using your table and graph above, identify the solution(s) for equation: $|x + 1| = 2 + \frac{1}{2}x$

14. Explain, in your own words, how to use the graphical technique to solve algebraic equations.