

Identifying a Function and Its Domain and Range

Complete the following to 1) investigate when a relation is a function and 2) practice determining the domain and range of functions. Record your responses on this worksheet and the answer sheet. Turn in one answer sheet per team. Be sure to answer all parts of every question. Keep this packet for studying.

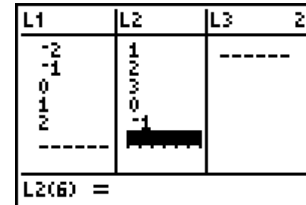
Calculator Instructions

For this activity, you will be constructing line graphs on your graphing calculator. The following explains how to accomplish this. The instructions and screen shots were obtained using a TI-84 Plus.

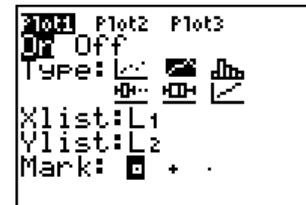
Let's practice constructing a line graph for the following set of points (shown right).

x	y
-2	1
-1	2
0	3
1	0
2	-1

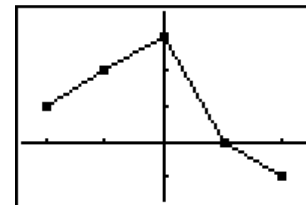
Begin by pressing **STAT** and choosing **1:Edit**. Enter the values for x in L1. Enter the values for y in L2. Your screen should look like the one shown to the right when done.



Now press **2ND** [STAT PLOT] and choose **1:Plot1**. Select **On** by pressing **ENTER** when the cursor is on that option. To move down to the next line press **↓**. Select **Line** for **Type**. The **Xlist** should be L1. If not, then press **2ND**, **1** when the cursor is on **Xlist**. The **Ylist** should be L2 (press **2ND**, **2** to change the list, if needed). Select **□** for **Mark**. Your screen should look the one shown to the right when done.



Finally to view the line graph, press **ZOOM** and choose **9:ZoomStat**. Your screen should look like this when done.

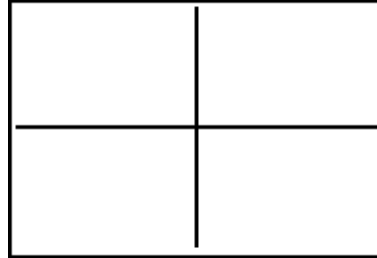


Part I

For Problems 1-3, you are given a set of points. Construct a line graph on your graphing calculator and sketch a copy of your screen. Then evaluate whether the given set of points determine a function.

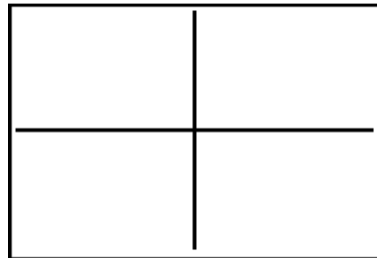
1.

x	y
-14	12
-7	0
-14	-6
0	-10
-14	-15



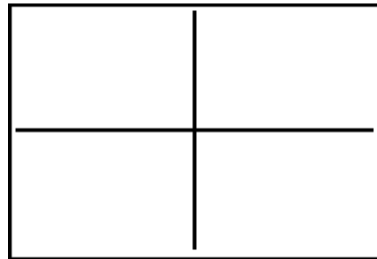
2.

x	y
-7	5
-3	5
0	0
2	-6
11	-6



3.

x	y
5	4
3	2
1	0
3	-2
5	-4



4. Based on the results above, make a generalization about how you can determine whether a given set of points are those of a function.

Part II

For each problem below, you are given an incomplete set of points corresponding to a relation. Fill in the missing coordinates so that the set of points corresponds to a function.

5.

x	Y
25	-8
-17	-1
<input type="text"/>	-8
18	3

6.

x	Y
67	22
-67	<input type="text"/>
31	-22
67	22

7.

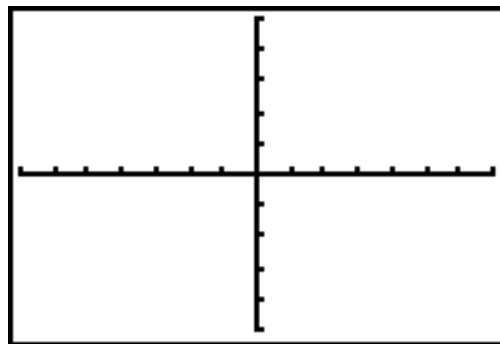
x	y
5	-3
-5	0
5	<input type="text"/>
0	5
5	-3

Part III

For each problem below, you are given an equation and values for either the x - or y -coordinates in a table. Complete the table, sketch the graph, and determine if the equation is a function.

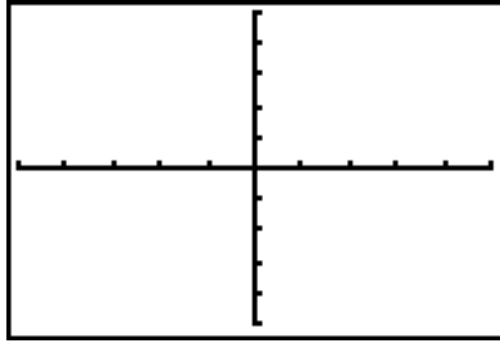
8. $x = y^2 + 1$

x	y
	-2
	-1
	0
	1
	2



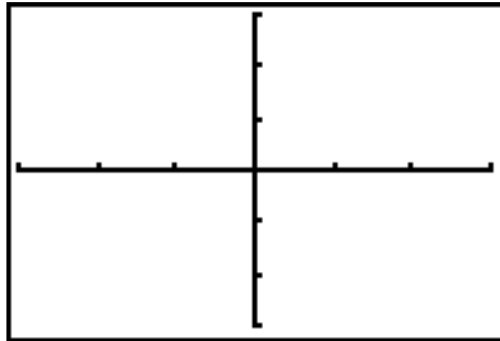
9. $y = x^2 - 1$

x	y
-2	
-1	
0	
1	
2	



10. $x^2 + y^2 = 4$

x	y
-2	
-1	
0	
1	
2	



Part IV

For each problem below, you are given the set of points of a function. Using roster notation, write the domain and range of each function.

11. $\{(17, 22), (34, 29), (26, 22), (11, 18), (21, 18), (38, 18)\}$

Domain:

Range:

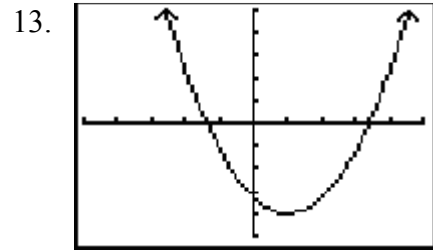
12. $\{(-4, 1), (-3, 2), (-6, 2), (-1, 2), (0, 1), (-5, 2)\}$

Domain:

Range:

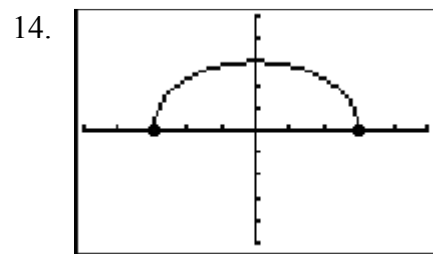
Part V

For each problem below, you are given the graph of a function. Using interval notation, write the domain and range of each function. Assume that the scale of each graph is 1.



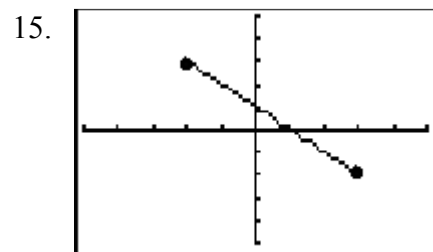
Domain:

Range:



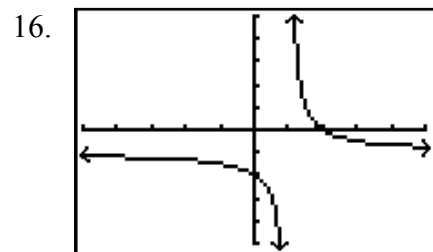
Domain:

Range:



Domain:

Range:



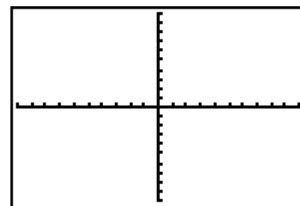
Domain:

Range:

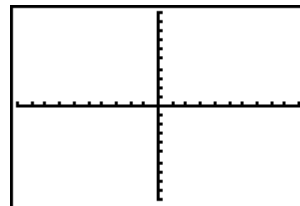
Part VI

Write the domain of each function given below in interval notation. Then graph the function on your graphing calculator to confirm your answer. Sketch a copy of your calculator screen. Be sure to draw arrows if the graph continues or endpoints if the graph terminates.

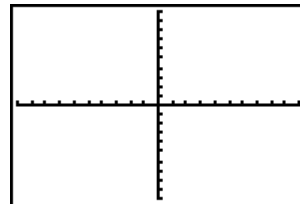
17. $f(x) = 3x^2 + 13x + 4$



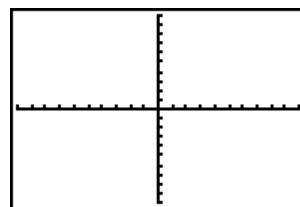
18. $f(x) = \frac{1}{x+3}$



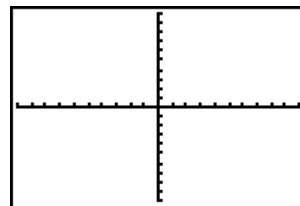
19. $f(x) = \frac{x^2 + x}{x^2 + 3x - 10}$



20. $f(x) = \sqrt{7-x}$



21. $f(x) = \frac{-2}{\sqrt{5+x}}$



Part VII

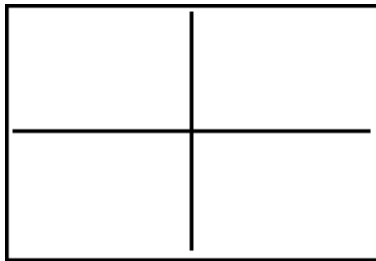
Answer the following problems.

1. A company manufactures notebook computers. The price-demand function corresponding to the notebook computers is

$$p(x) = 2,000 - 60x$$

where p is the price per computer at which x thousand of computers are sold.

- a. Graph and interpret the price-demand equation.



- b. What is the domain of this function, in interval notation?
- c. Is the domain determined in (b) sensible for the situation? Describe a more realistic domain.