

(4 points)

1. The average water bill for homeowners in several cities is given in the table below.

Average Water Bill (dollars)	37	38.50	30.25	28.75	43.50	25.20	25.50
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a. Find the median water bill of the cities listed in the table.

b. Find the mean water bill.

(6 points)

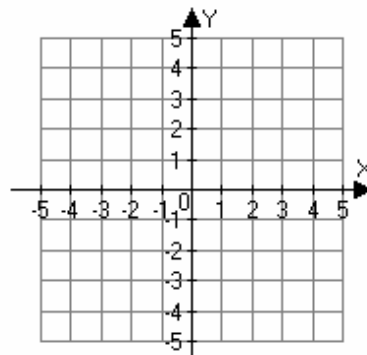
2. Determine whether the given relation is a function or is not a function.

a. Create a scatterplot of the data.

Input	-1	0	1	2	-1
Output	1	2	3	4	5

b. State the domain _____

c. State the range. _____



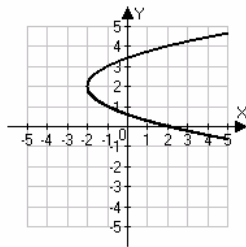
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(4 points)

3. Write a function that describes the relationship between the two quantities: the number of yards is a function of the number of feet.

(3 points)

4. Use the vertical line test to determine whether the given relation is a function.



(6 points)

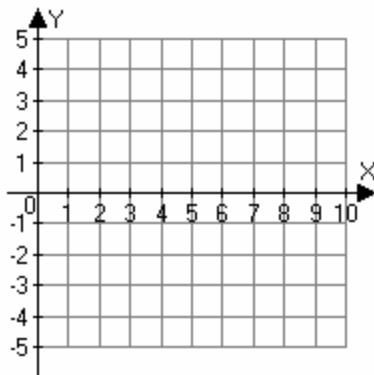
5. Let $f(x) = -x^2 - 3x + 2$ and $g(x) = -2x - 3$.
- Complete the table of values.
 - Find $g(-1) - f(1)$
 - Find $f(-1) + g(1)$

x	-1	1
f(x)		
g(x)		

(6 points)

6. For the function $f(x) = \sqrt{x+1}$, do the following:
- Complete the table of values
 - Draw a sketch of the function.

x	-1	0	3	8
f(x)				



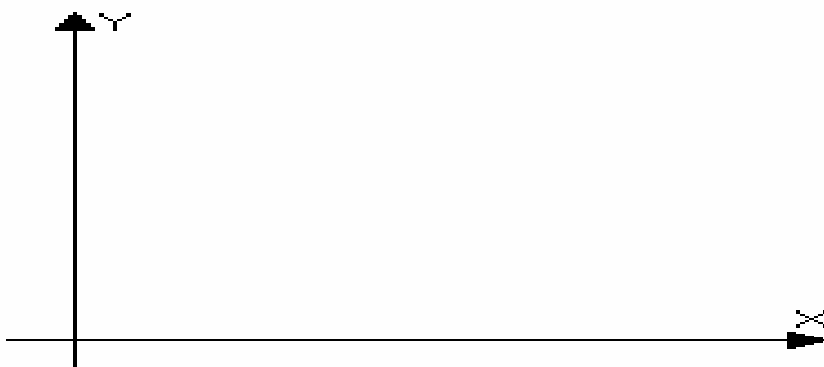
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(7 points)

7. The data in the table below shows the number of households with cable TV in the United States for various years.

Year	1980	1985	1990	1995	2000	2003
Households (in Millions)	17.7	39.9	54.9	63	69.3	73.4

- a. Draw a scatterplot that shows the number of households with cable TV versus the year. Describe the pattern that you see.



- b. During what year were cable TV subscriptions a maximum? A minimum?
- c. Find the percent change in the number of households with cable TV from 1980 to 2003.
- d. Find the average rate of change in the number of households with cable TV from 1980 to 2003.
- e. List the domain and range of the function $f(t)$ that gives the number of households with cable TV as a function of the year t .
- f. Find and interpret $f(1990)$.
- g. Interpret $f(t) = 39.9$ and find the value of t that satisfies the function.

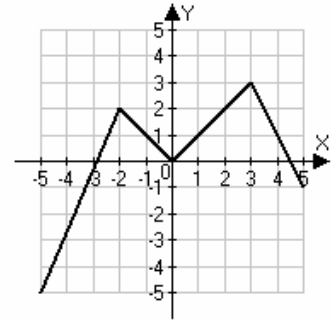
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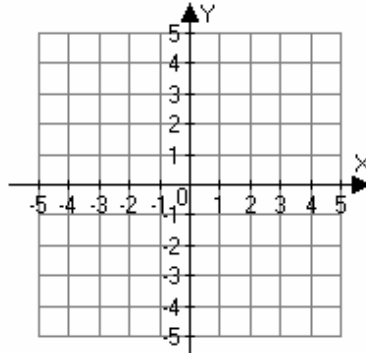
8. Use the graph to answer the following questions.

a. Complete the tables of values using the given graph.

x	-5	-2			5
f(x)			1	3	



b. Sketch the graph of $f(x) + 2$.



c. Find $g(2)$ if $g(x) = f(x - 2) - 3$

(4 points)

9. The amount of your monthly water bill is a function of the amount of water you use: $A = f(g)$ where g is the number of gallons used in the month and A is the amount of your bill in dollars. Interpret the meaning of the following symbols:

a. $f(200)$

b. $f(g) = 55$

(6 points)

10. Evaluate the function $f(x) = \sqrt{3-x}$ for the values given. If the value is not defined, explain why.

a. $f(5)$

b. $f(-6)$

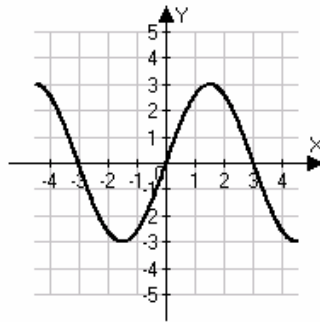
c. Find the implied domain of the function $y = \sqrt{3-x}$.

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(7 points)

11. Approximate the following for the given function.

- a. Where is $f(x) = 0$? b. Where is $f(x) > 0$? c. Where is $f(x) < 0$? d. Where is $f(x)$ increasing?
- e. Where is $f(x)$ decreasing? f. If $f(x)$ has a maximum, where does the maximum occur and what is the maximum? g. If $f(x)$ has a minimum, where does the minimum occur and what is the minimum?



a. _____ b. _____ c. _____

d. _____ e. _____ f. _____

g. _____

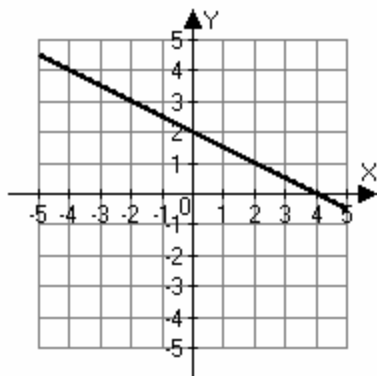
(5 points)

12. Find the average rate of change of $f(x) = x^2 - x + 1$ between $x = 4$ and $x = 4.5$.

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(5 points)

13. Find the slope, y-intercept, and x-intercept of the following linear function and write a symbolic representation.



(5 points)

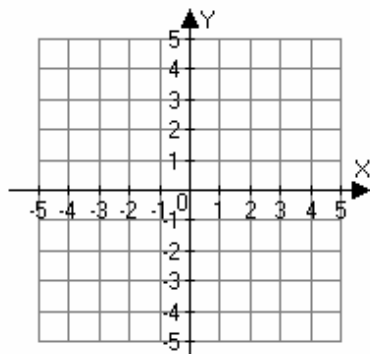
14. Give the slope-intercept equation for the following lines:

a. The line that has slope $-\frac{2}{5}$ and a y-intercept of -1 .

b. $4x - 12y = 12$

(4 points)

16. Graph the equation $y = -\frac{1}{3}(x - 1) + 1$.



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(5 points)

17. Write an equation for line through the points $(1,4)$ and $(-2,-4)$.

(5 points)

18. A company that manufactures computer keyboards has fixed costs of \$3,500 per day and total costs of \$8,000 per day when 500 keyboards are made.

a. Write an equation that relates cost to the number of keyboards made.

b. Graph the equation.



c. Interpret the slope and y-intercept in terms of the variables given.

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(5 points)

19. Write a linear equation for the line through the point $(-1, -2)$ parallel to the line $4x - 2y = 8$

(6 points)

20. The cost of a taxi ride is a function of the distance traveled during the ride.

- If it costs \$0.25 per mile, write a function $C(m)$ that gives total cost of a taxi ride if m miles are traveled.
- Find the range of costs if the furthest a taxi can travel in the city is 25 miles, that is, if $0 \leq m \leq 25$.
- If the ride costs \$1.50 and \$0.15 per mile, write a function $S(m)$ that gives total cost of a taxi ride if m miles are traveled. Find the range of costs if the furthest a taxi can travel in the city is 25 miles, that is, if $0 \leq m \leq 25$.
- Fill in the following table of values. Graph both functions for $0 \leq t \leq 25$.

m	0	5	10	15	20	25
$C(m)$						
$S(m)$						



- Which taxi ride is a better deal? Explain.