

Name _____

Test 1B
College Algebra
MATH 1314
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Summer 2008

Deadline: 6/13/2008

Tools: Any calculator

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(4 points)

1. Data on CD DVD sales is given in the table below. Use the data to answer the questions.

Year	2000	2001	2002	2003	2004
DVD Sales (in thousands)	1137	2684	4543	7620	15743

- a. How many DVD's were sold in 2004?

- b. Find the median DVD sales for the years listed in the table.

- c. Find the mean DVD sales for the years listed in the table.

(6 points)

2. Use the data in the table to answer the following questions.

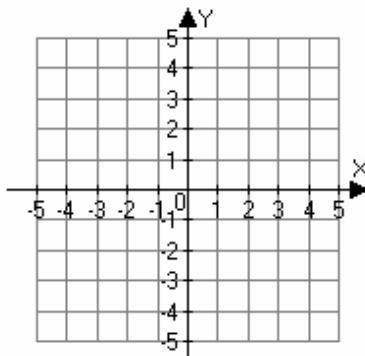
- a. Create a scatterplot of the data.

- b. State the domain _____

- c. State the range. _____

- d. Determine whether the given relation is a function or is not a function.

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



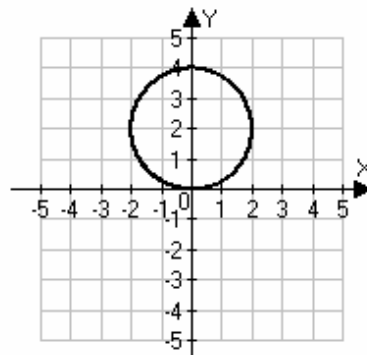
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(4 points)

3. Write a function that describes the relationship between the two quantities: The number of yards, y , as a function of the number of inches, x . Hint: There are 36 inches in a yard.

(3 points)

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



(6 points)

5. Let $f(x) = -2x^2 + x - 4$ and $g(x) = -\frac{1}{3}x + 1$.

x	-3	3
$f(x)$		
$g(x)$		

a) Complete the table of values.

b) Find $g(-3) - f(-3)$

c) Find $f(3) + g(3)$

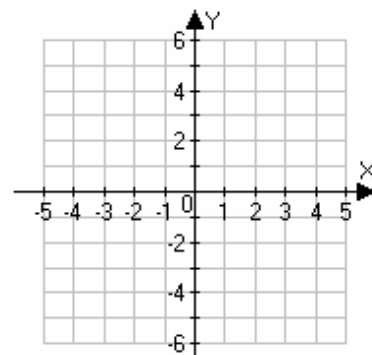
(6 points)

6. For the function $f(x) = -x^2 + 2$, do the following:

a. Complete the table of values

b. Draw a sketch of the function.

x	-2	-1	0	1	2
$f(x)$					



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(7 points)

7. The table below shows the overall sales of music videos for the given years.

Year	2000	2001	2002	2003	2004
Sales (in thousands)	3,683	4,775	5,806	8,155	15,972

Source: *Nielsen SoundScan*

- a. Draw a scatterplot of the data with year as input and sales as output. Describe any trend in the data.



- b. During what year was the sale of music videos a maximum? _____
- c. During what year was the sale of music videos a minimum? _____
- d. Find and interpret $f(2001)$.
- e. Interpret $f(x) = 4775$ and find the value of x that satisfies the function.
- f. Find the percent change in the sale of music videos from 2000 to 2004.
- g. Find the average rate of change in the sale of music videos from 2003 to 2004.

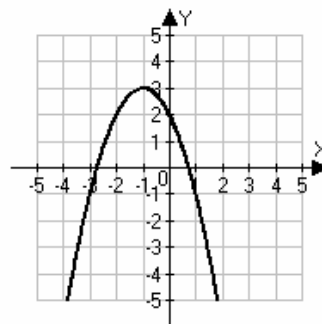
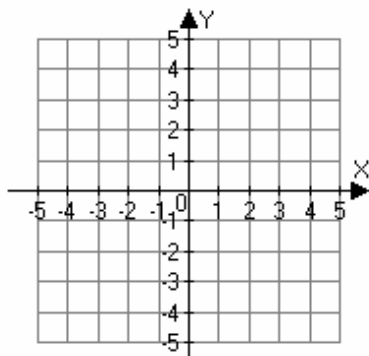
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(6 points)

8. Use the graph to answer the following questions.
 a. Complete the tables of values using the given graph.

x	-3	-2		0	
$f(x)$			-1		-1

- b. Sketch the graph of $f(x - 1)$.



- c. Find $g(0)$ if $g(x) = f(x - 2) + 1$

(4 points)

9. The amount of gas it takes to drive a certain distance is a function of distance you drive: $g = f(d)$ where g is the number of gallons it takes to drive the distance and d is the distance (in miles) to be driven. Interpret the meaning of the following symbols.

- a. $f(500)$
 b. $f(d) = 4.5$

(6 points)

10. Evaluate the function $f(x) = \sqrt{x-2}$ for the values given. If the value is not defined, explain why.

- a. $f(11)$
 b. $f(-2)$
 c. Find the implied domain of the function $f(x) = \sqrt{x-2}$.

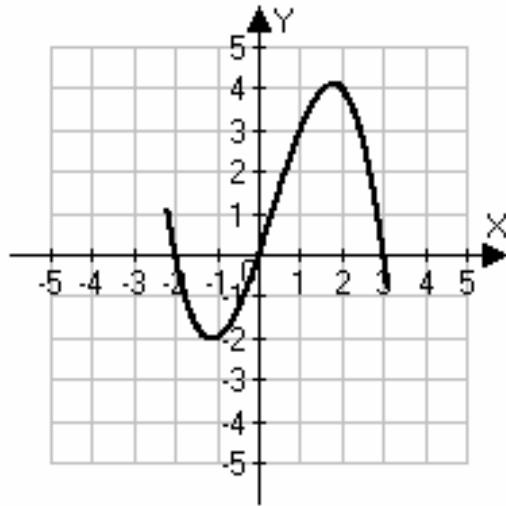
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(7 points)

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. _____



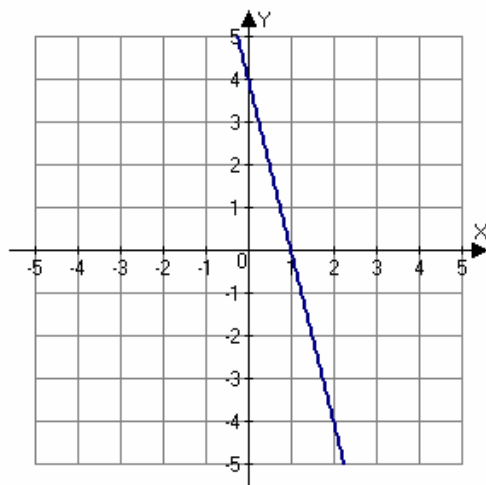
(5 points)

12. Find the average rate of change of the function $f(x) = -x^2 + 3$ between $x = 3.1$ and $x = 4$.

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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.



- a. slope _____
b. y -intercept _____
c. x -intercept _____
d. $f(x) =$ _____

(5 points)

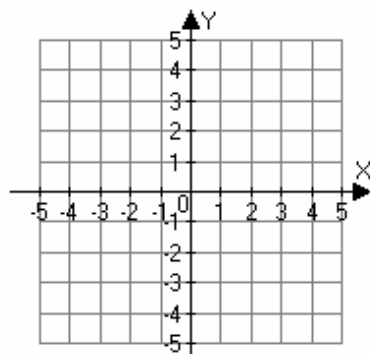
14. Give the slope-intercept equation for the following lines:

a. The line that has slope $-\frac{2}{7}$ and a y-intercept of -5 .

b. $-2x - 3y = -4$

(4 points)

15. Graph the equation $y = -\frac{3}{4}(x + 2) + 1$.



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(5 points)

16. The average cost of a home in Austin was \$99,700 in 1990 and \$186,400 in 2001. Write a linear function that gives the cost of a home in Austin as a function of x , the number of years since 1990. Use the function to predict the average cost of a home in Austin in 2010.

(5 points)

17. A company that manufactures DVD's has fixed costs of \$2,500 per day and total costs of \$17,500 per day when 5000 DVD's are made.

a. Write an equation that relates cost to the number of DVD's made.

b. Graph the equation.



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

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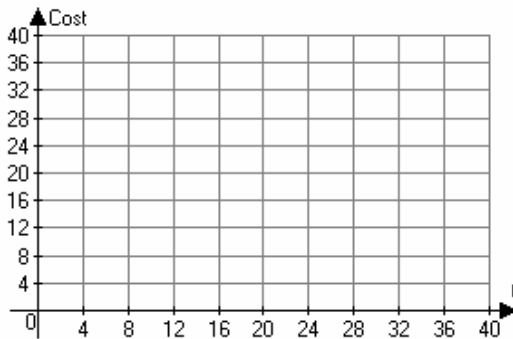
(6 points)

19. The cost of internet access is sometimes a function of how many hours of access are used each month.
- Worldwide Access charges \$0.75 per hour of internet access used. Write a function $W(t)$ that gives the total monthly cost if t hours are used. Find the range of costs if the most access that can be used is 40 hours a month, that is, if $0 \leq t \leq 40$.

 - If Global Access charges \$12.00 a month plus \$0.15 per hour, write a function $G(t)$ that gives the total monthly cost if t hours are used. Find the range of costs if the most access that can be used is 40 hours a month, that is, if $0 \leq t \leq 40$.

 - Fill in the following table of values. Graph both functions for $0 \leq t \leq 40$.

t	0	8	20	32	40
$W(t)$					
$G(t)$					



- Which plan is a better deal? Explain.

(10 points)

20. Suppose $f(x)$ and $g(x)$ are defined by the following tables.

x	-3	-2	-1	0	1	2	3
$f(x)$	1	2	3	4	5	6	7

x	-3	-2	-1	0	1	2	3
$g(x)$	7	6	5	4	3	2	1

Find the following:

- a) $f(3) = \underline{\hspace{2cm}}$
- b) $g(-2) = \underline{\hspace{2cm}}$
- c) $f^{-1}(4) = \underline{\hspace{2cm}}$
- d) $(f + g)(3) = \underline{\hspace{2cm}}$
- e) $(fg)(-2) = \underline{\hspace{2cm}}$
- f) $(f \circ g)(1) = \underline{\hspace{2cm}}$
- g) $(g \circ f)(-1) = \underline{\hspace{2cm}}$
- h) $f^{-1}(7) = \underline{\hspace{2cm}}$
- i) $g^{-1}(8) = \underline{\hspace{2cm}}$
- j) $h(2)$ if $h(x) = f(x - 1)$; $h(2) = \underline{\hspace{2cm}}$