

Name \_\_\_\_\_

**Test 1**  
**College Algebra**  
**MATH 1314**  
**Mike Huff**

**Deadline: 6/15/2007**

**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.

<b>Year</b>	2000	2001	2002	2003	2004
<b>DVD Sales (in thousands)</b>	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.

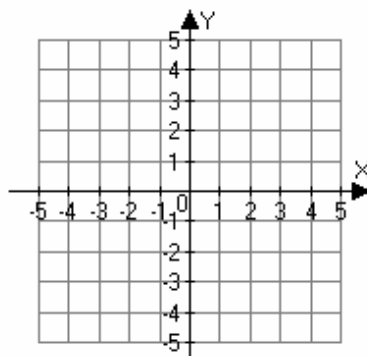
**(6 points)**

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. \_\_\_\_\_

<b>Input</b>	-2	-1	0	1	2
<b>Output</b>	-4	-3	0	-1	-2

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



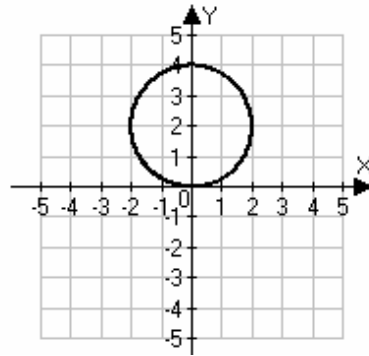
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**(4 points)**

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  $g(x) = -\frac{1}{3}x + 1$ .

a) Complete the table of values.

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

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

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

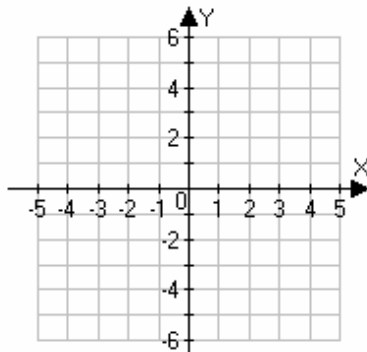
**(6 points)**

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

a. Complete the table of values

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

b. Draw a sketch of the function.



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**(7 points)**

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

<b>Year</b>	2000	2001	2002	2003	2004
<b>Sales (in thousands)</b>	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.



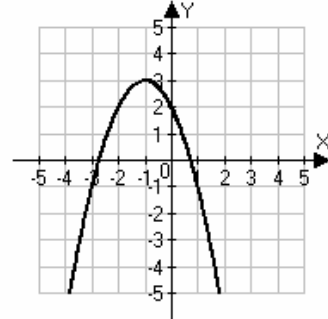
- b. During what year was the sale of music videos a maximum? \_\_\_\_\_
- c. During what year was the sale of music videos a minimum? \_\_\_\_\_
- d. Find and interpret  $f(2001)$ .
- e. Interpret  $f(x) = 4775$  and find the value of  $x$  that satisfies the function.
- f. Find the percent change in 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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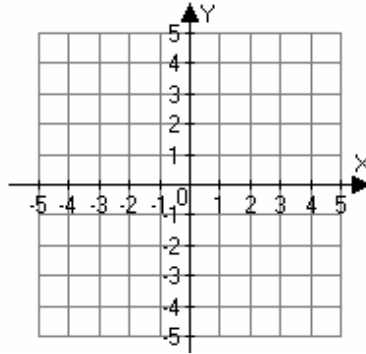
**(6 points)**

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  $f(x) = \sqrt{x-2}$ .

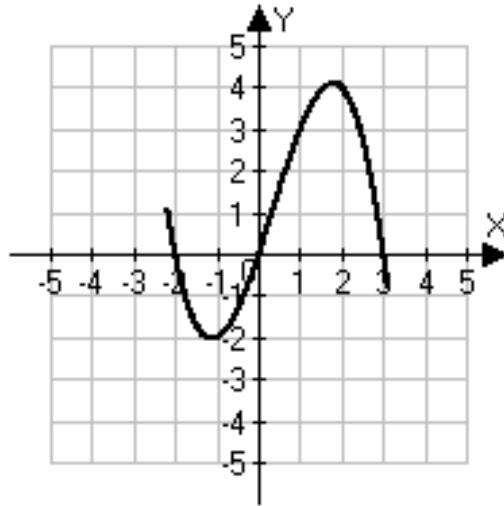
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**(7 points)**

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. \_\_\_\_\_



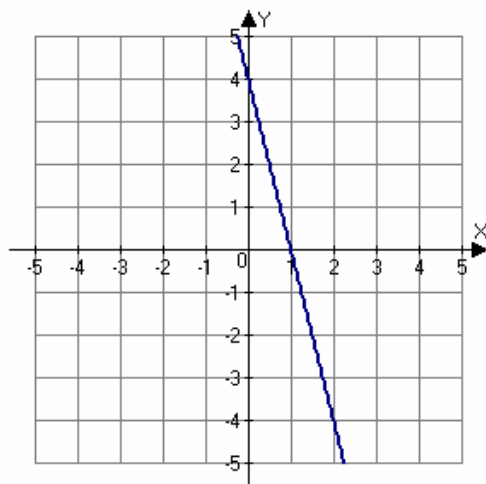
**(5 points)**

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. equation \_\_\_\_\_

**(5 points)**

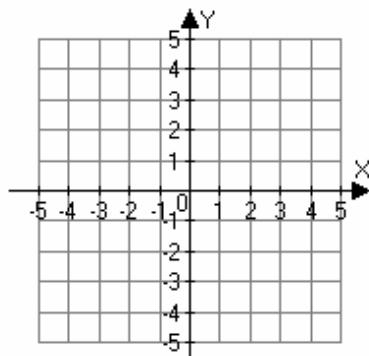
14. Give the slope-intercept equation for the following lines:

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. Write an equation for line through the points  $(-3, -1)$  and  $(1, 4)$ .

**(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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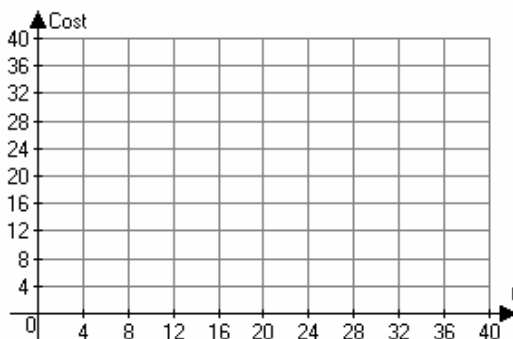
**(5 points)**

18. Write a linear equation for the line through the point  $(-2, -4)$  perpendicular to the line  $-x - 3y = 6$

**(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.