

Math 105 Exam 2 Mar 22, 2007
Chapters 2.1 – 2.6

Name _____ Instructor name or section # _____

1	2	3	4	5	6	7	8	9	10	11	12	EC	total
12	6	6	16	4	8	8	10	6	8	12	4	2	100

Given: Odd (origin symmetry): $f(-x) = -f(x)$, Even (y-axis symmetry): $f(x) = f(-x)$
 Ave Rate of Change = $\frac{f(x_2) - f(x_1)}{x_2 - x_1}$, point slope form of a line: $(y - y_1) = m(x - x_1)$, slope intercept form of a line: $y = mx + b$, general form of a line: $ax + by + c = 0$

Show All Work for Full Credit!!

1. (2 pts ea) Find the following if $f(x) = \sqrt{x}$ and $g(x) = x - 6$. Also use interval or set notation to express the domain.

a.) $(f + g)(x) =$ _____ b.) domain: _____

c.) $\left(\frac{f}{g}\right)(x) =$ _____ d.) domain: _____

e.) $g(f(x)) =$ _____ f.) domain: _____

2. (1 pt ea) Evaluate and simplify the functions at the given values

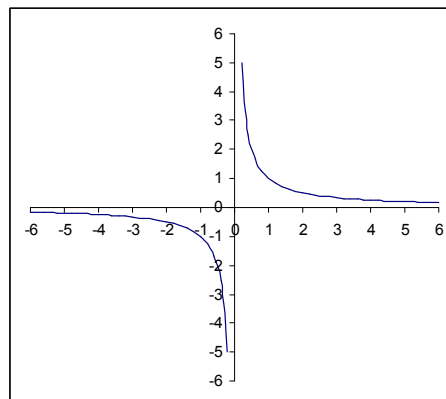
a.) $f(x) = 6x + 3$ $f(7) =$ _____, $f(x + h) =$ _____, $f(-x) =$ _____

b.) $g(r) = \sqrt{r+7}$ $g(-7) =$ _____, $g(42) =$ _____, $g(x - 7) =$ _____

3. (2 pts ea) Determine whether the following relations, equations or graphs define y as a function of x.

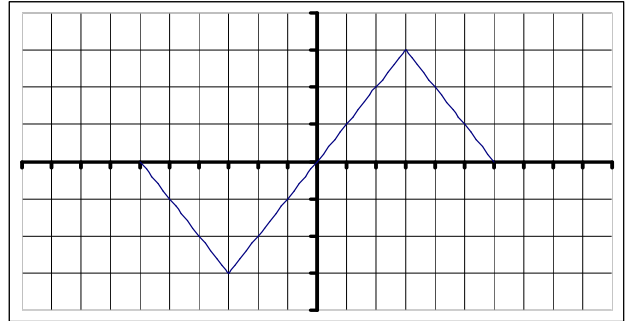
a. $\{(1,1), (2, 2), (3, 3), (4, 4)\}$ Function? Yes No

b. $x^2 + y^2 = 9$ Function? Yes No c. Graph \rightarrow
Function? Yes No



4. (4 pts ea) Is $f(x)$ graph to the right) odd, even or neither? _____,

Why? _____

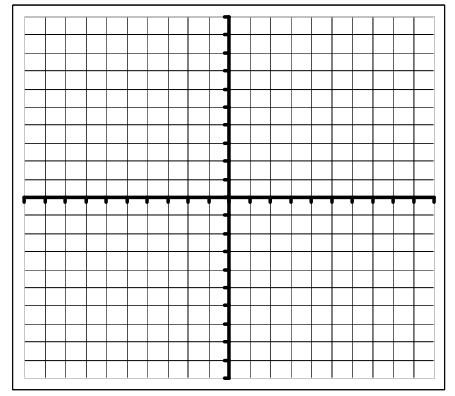
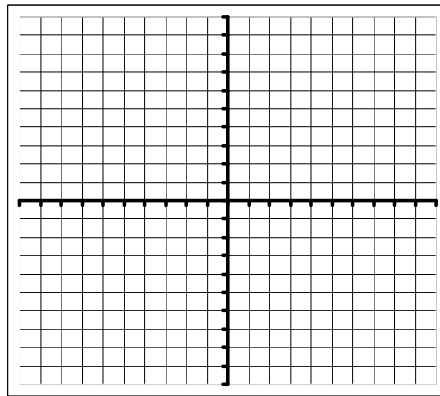
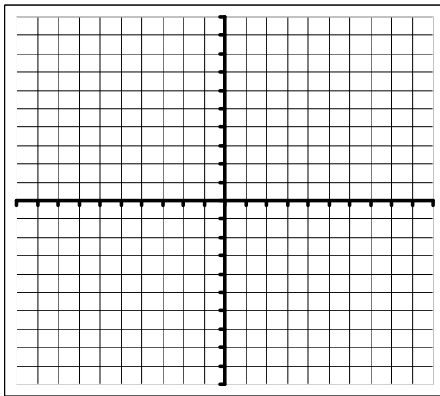


Use the graph of $y = f(x)$, to the right, to graph the following functions. Gridmarks are one unit.

$y = f(-x)$

$y = 2f(x)$

$y = f(x + 3)$



5. (4 pts) Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for $f(x) = -4x + 7$

6. (2 pts ea) Given the piecewise function $g(x)$, evaluate at three points given below.

$$g(x) = \begin{cases} \sqrt{x-1} & x \geq 1 \\ 0 & x < 1 \end{cases} \quad g(-4) = \underline{\hspace{2cm}} \quad g(0) = \underline{\hspace{2cm}} \quad g(1) = \underline{\hspace{2cm}}$$

7. (2 pts ea) Given $m(x) = x^6 - x^4 - 1$. a.) Find and simplify $m(-x)$

b.) Find and simplify $-m(x)$ _____

c.) If $h(x) = |x-5| = (f \circ g)(x)$ find $f(x) = \underline{\hspace{2cm}}$ $g(x) = \underline{\hspace{2cm}}$

8. (1 pt ea) Using the graph of $y = f(x)$ to the right, enter the following, if they exist, using interval notation. Gridmarks are one unit.

Domain of $f(x)$: _____

Range of $f(x)$: _____

Region of increasing: _____

Region of decreasing: _____

Where is the relative min: _____

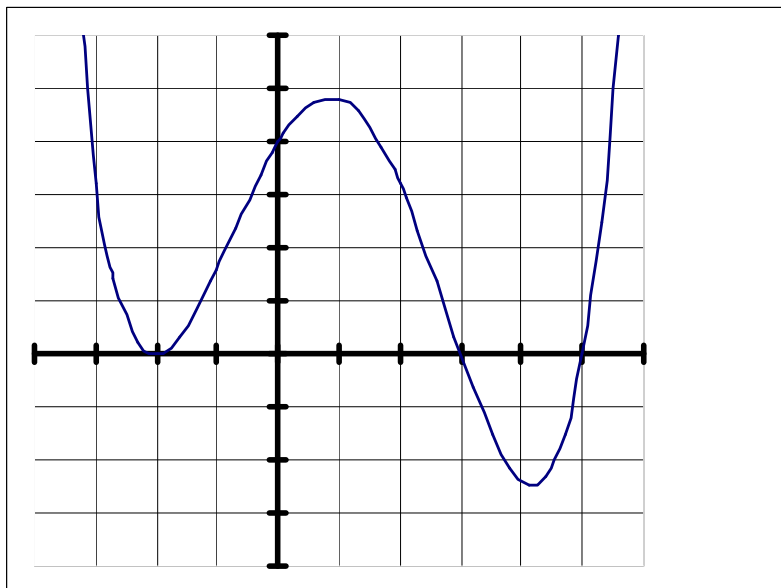
Where is the relative max: _____

What is the relative min: _____

What is the relative max: _____

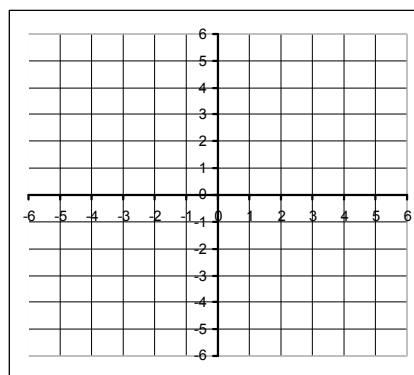
x-intercept _____,

y-intercept _____



9. (3 pts ea) Graph the following equations on the given rectangular coordinate system:

$y = 3, x = 5$



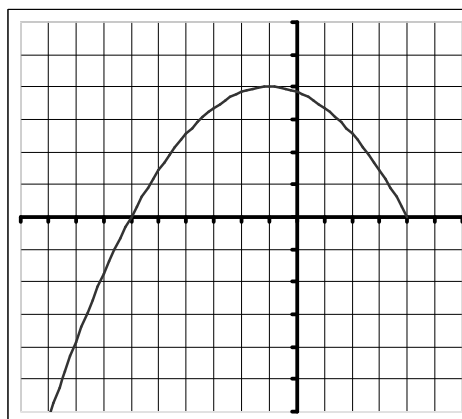
10. (2 pts ea) Use the graph of $f(x)$ at right to determine each of the following:

a.) The zero's of $f(x)$. $x =$ _____

b.) $f(-3.5) =$ _____

c.) The values of x where $f(x) = 1$: $x =$ _____

d.) Is $f(0)$ positive or negative? pos neg



11. (3 pts ea) Use the given conditions to write the following equations for the line:
a.) Slope = $\frac{1}{2}$, passing through the origin.

Point-slope form: _____

Slope-intercept form: _____

b.) Passing through (3, 1) with x-intercept 1

Point-slope form: _____

Slope-intercept form: _____

12. (4 pts) Find the average rate of change of $f(x) = x^2 + 6x$ from $x_1 = 2$ to $x_2 = 5$.

E.C. (2 pts) Show the algebra to prove that the line going through (a, 0) and (0, b) where $a \neq 0$ and $b \neq 0$, can be written in the form $\frac{x}{a} + \frac{y}{b} = 1$