

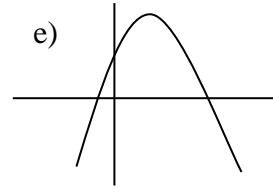
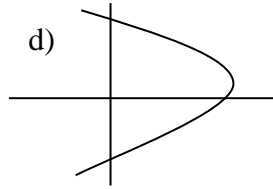
Name: _____

Show work where appropriate. Answers without adequate justification will not receive full credit.

1) (7pts) Circle the letter for each of the following which represent a function.

a)

x	5	7	9
$f(x)$	-1	4	4

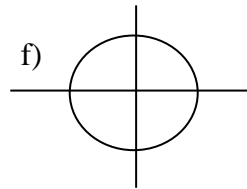


b)

x	5	7	7
$g(x)$	-1	4	6

c)

x	5	7	9
$h(x)$	-1	4	6



g) If any of the functions you circled are also one-to-one write the letter(s) here _____

2) (7pts) The function $f(x)$ is represented by the table below

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

a) Evaluate $f(-1)$

b) Solve $f(x) = 2$

c) Is $f(x)$ one-to-one?

d) Find the average rate of change of $f(x)$ on $[0,2]$

3) (5pts) Given $g(x) = 5x - x^2$, evaluate & simplify

a) $g(-3)$

b) $g(x+2)$

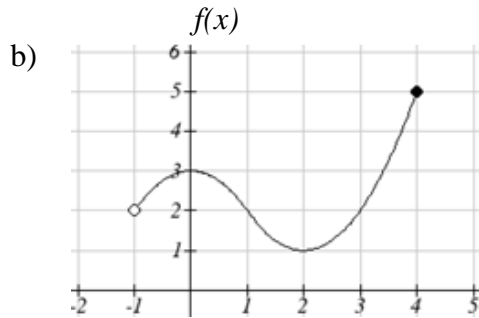
4) (3pts) A function $G = f(n)$ gives the number of tons of garbage, G , produced by n households in a month. Explain the meaning of $f(4) = 9$ in words. (Answer in a complete sentence)

5) (5pts) Find and simplify the average rate of change of $g(x) = x^2 - 3x$ on the interval $[a, 1]$

6) (10pts) Find the domain of $g(x)$. Find the domain & range of $f(x)$, the interval on which $f(x)$ is decreasing, and the interval on which $f(x)$ is concave up. Write your answers in interval notation.

a) $g(x) = \frac{\sqrt{x-2}}{x-4}$

Domain of $g(x)$ _____



Domain of $f(x)$ _____

Range of $f(x)$ _____

$f(x)$ is decreasing on: _____

$f(x)$ is concave up on: _____

7) (10pts) Given the table below, evaluate the following:

x	$f(x)$	$g(x)$
0	7	5
1	5	7
2	1	8
3	8	3
4	9	6
5	6	0
6	4	1
7	2	4
8	3	2
9	0	9

a. $f(g(3)) =$ _____

b. $g(f(1)) =$ _____

c. $f(f(2)) =$ _____

d. $g^{-1}(4) =$ _____

e. $f^{-1}(4) =$ _____

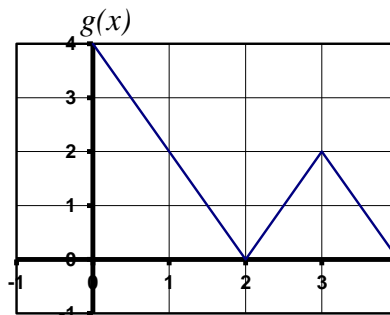
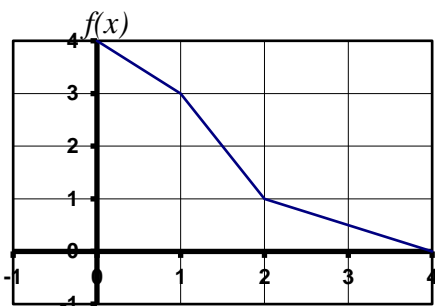
8) (11pts) Given $f(x) = 2\sqrt{x+4}$ and $g(x) = 2x^2 - 4$

a) Evaluate $g(f(5))$

b) Find & Simplify $f(g(x))$

c) What is the domain of $f(g(x))$

9) (4pts) Based on the graphs shown below



a. Evaluate $f(g(3))$

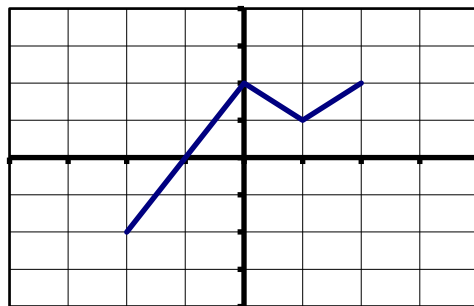
b. Evaluate $f^{-1}(1)$

10) (5pts) Suppose the function $P(t)$ gives the estimated population of a town t years after 2011. The function $N(c)$ gives the size of population that c police officers can patrol. Interpret (explain in plain English) the meaning of the statement $200 = N^{-1}(P(5))$

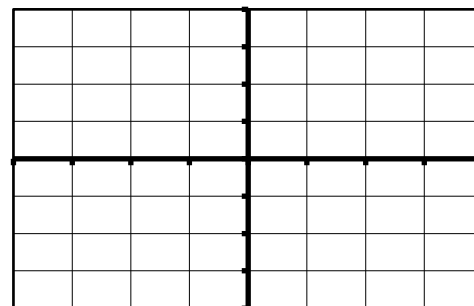
11) (4pts) If $f(x) = 350 + 15x$, find $f^{-1}(50)$

12) (5pts) Write an equation for a square root function that has been flipped over the y-axis, compressed horizontally by $\frac{1}{2}$, and shifted up 3.

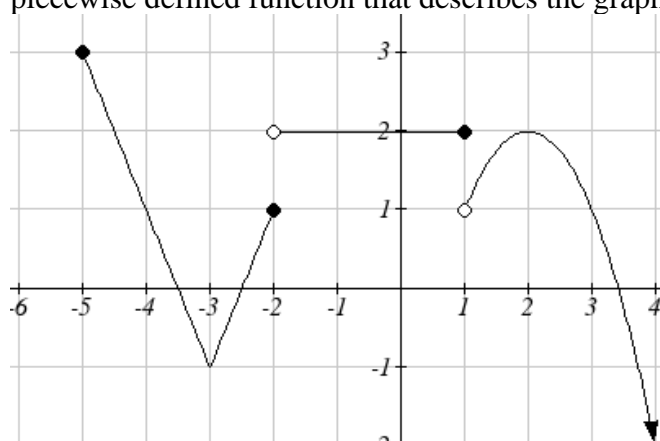
13) (10pts) Based on the graph of $f(x)$ given here



Sketch a graph of $g(x) = -2f(x+1)$ and describe the transformation in words



14) (13pts) The following graph is made from pieces of three transformed toolkit functions. Write a piecewise defined function that describes the graph.



$$f(x) = \begin{cases} \text{_____ if _____} \\ \text{_____ if _____} \\ \text{_____ if _____} \end{cases}$$

15) (1pt) What is your instructors name? _____