

Name: _____
Math 121, College Algebra – Crawford

Exam 2-A
12 April 2017

Score

1	/12
2	/6
3	/14
4	/6
5	/14
6	/6
7	/4
8	/6
9	/6
10	/6
11	/12
12	/10
Total	/100

- Books or notes (in any form) are not allowed.
- You may use a calculator, but show all work.
- **Show all your work** – partial credit may be given for written work.
- Clearly indicate your answers.
- Problems 6, 7, 8, and 9 will count toward extra credit on Quiz 4.
- Good Luck!

Formulas that may or may not be helpful:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-b}{2a}$$

1. (12 pts). Write an equation of a line with the given properties. Write your final answer in the form $y = mx + b$.

(a). Passes through the points $(3, 4)$ and $(5, 4)$.

(b). Passes through the point $(2, -1)$ and is perpendicular to the line $4x + 6y = 6$.

2. (6 pts). A pharmaceutical salesperson receives a monthly salary of \$2500 plus a commission of 7% of sales. Write a *linear* equation for the salesperson's monthly wages W in terms of monthly sales s .

3. (14 pts). Solve the following equations for x . Check your solutions and clearly indicate your answer.

(a). $\sqrt{x+3} - 6 = 0$

(b). $|4 - 2x| = 6x$

4. (6 pts). Solve the following linear inequality. Then **graph** the solution on the real number line.

$$-2(x+2) \geq 3x+4$$

5. (14 pts). Solve the following nonlinear inequalities. Then **graph** the solution on the real number line.

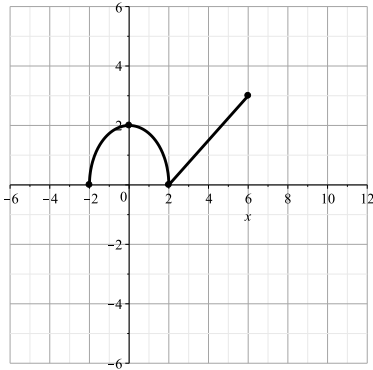
(a). $x^2 - 3x - 9 > 1$

(b). $\frac{x+4}{x} \leq 0$

6. (6 pts). Determine whether the following function is odd, even, or neither. [You must show algebraic work to justify your answer.]

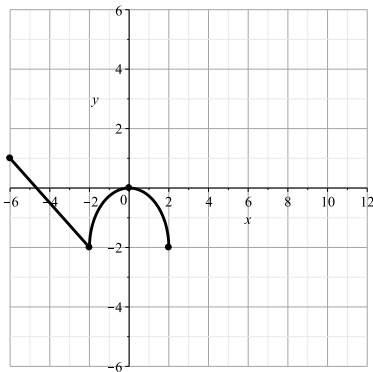
$$f(x) = x^3 + x$$

7. (4 pts). Given the graph of $f(x)$ below,

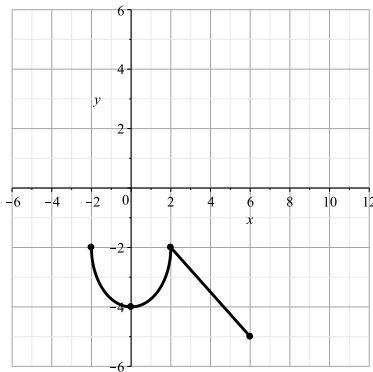


(a). Which of the following is a graph of $y = f(-x) - 2$?

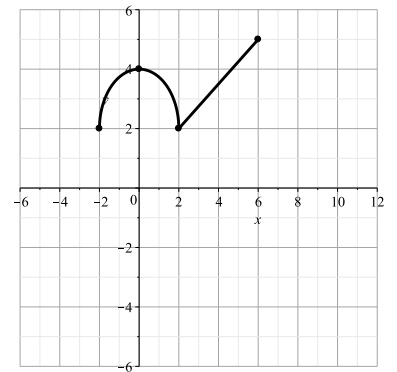
(i)



(ii)

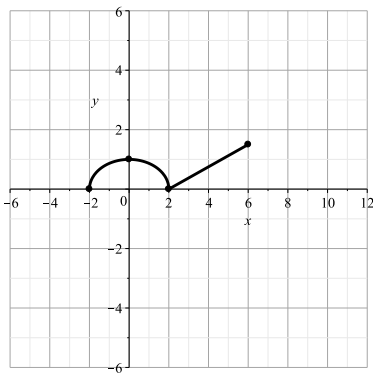


(iii)

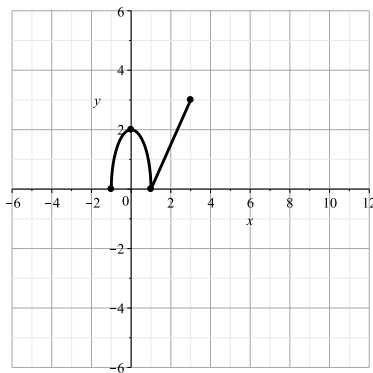


(b). Which of the following is a graph of $y = f(\frac{1}{2}x)$?

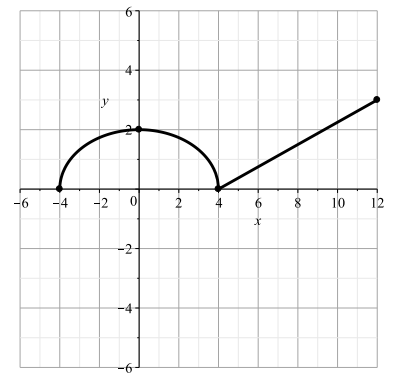
(i)



(ii)



(iii)



8. (6 pts). Given $f(x) = x^4$ and $g(x) = x + 5$, evaluate $(fg)(-2)$.

9. (6 pts). Given $f(x) = x - 4$ and $g(x) = x^2 + 3$, find and simplify $f \circ g$.

10. (6 pts). Write the standard form of the equation of a parabola that has vertex $(2, 3)$ and passes through the point $(3, -5)$. Standard form: $f(x) = a(x - h)^2 + k$

11. (12 pts). Given the quadratic function $f(x) = \frac{1}{2}x^2 - 4x + 6$,

[You must show algebraic work to justify your answers.]

(a). Find the vertex point algebraically. [i.e., Use $x = \frac{-b}{2a}$]

(b). Find the x -intercepts algebraically.

12. (10 pts). Given $f(x) = \sqrt{2x + 4}$,

- (a). Find the inverse function algebraically. [Note: f does pass the Horizontal Line Test.]
[You must show all steps.]

- (b). Graph the original function $f(x) = \sqrt{2x + 4}$ on your calculator (or by hand).

From the graph, what is the range of $f(x)$?

What is the domain of the inverse function $f^{-1}(x)$?