Math 107 Exam #1
October 10, 2018

Time: 1 hour and 25 minutes
Instructions: Show all work for full credit. No outside materials or calculators allowed.
Extra Space: Use the backs of each sheet for extra space. Clearly label when doing so.

Name: _____

ID #: _____

Instructor/Section: _____

"I pledge by my honor that I have abided by the NJIT Academic Integrity Code."

_____ (Signature)

Problem(s)	Score	Total

Formulas you may need for this exam:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\left(\frac{x_1 + x_2}{2}\right), \left(\frac{y_1 + y_2}{2}\right)$$

1. Find the distance between each pair of points: **(12 points)**:

   a. $(5,9),(-7,-7)$

   b. $(-6,-10),(-2,-10)$

2. For the function, $f(x) = x^2 + 3x - 2$ find the following. Be sure to simplify fully when appropriate: **(16 points)**

a) $f(-2x)$

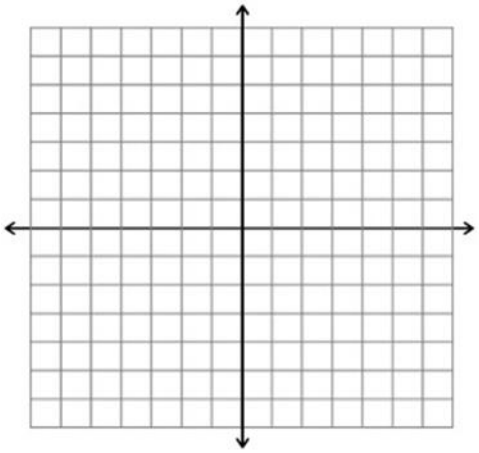
b) $f(4)$

c) $6f(x)$

d) $f(x) - f(3)$

3. **(6 points)** Graph the following piecewise function.

$$f(x)=\begin{cases} -4, x\le -2 \\ x-2, -2<x<2 \\ -2x+4, x\ge 2 \end{cases}$$

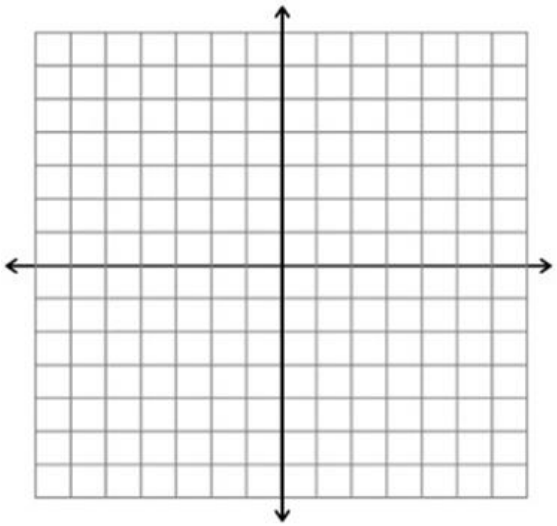


3. _____

4. **(14 points)** Write an equation for the function described by the given characteristics. Then graph the function.

   a) The shape of $f(x)=x^2$, but shifted 2 units left and 4 units down.

Equation:_____



5. Find the **equation of the line** with the given conditions. **(9 points)**

a. The slope is 3 and contains the point (-2,3)

a. _____

b. Parallel to the line $y=5$ and contains the point (4,2)

b. _____

c. Contains the points (-3,4) and (2,5)

c. _____

6. **(8 points)** Evaluate the following $f(x)=3x-2$ and $g(x)=x^3$

a. $(f+g)(2)$

a._____

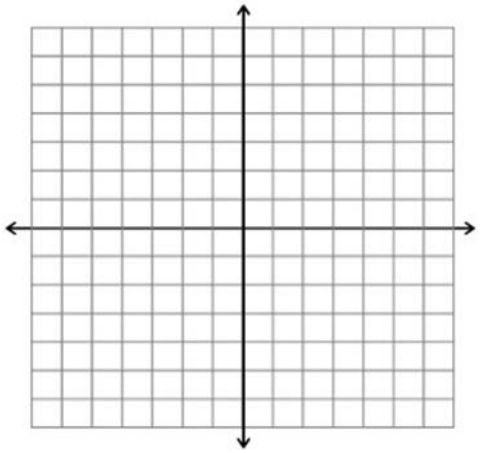
b. $(g-f)(2)$

b._____

c. $(fg)(2)$

c._____

7. Sketch the graph of the following equation. Identify the intercepts. $2x-3y-12=0$ **(8 points)**



8. Find the domain of the following functions. You must write your answer in interval notation: **(8 points)**

a. $f(x)=\dfrac{7+2x}{2+x}$

a)_____

b. $h(x)=\dfrac{x^2}{x^2+9}$

b)_____

9. Use the tests for symmetry to determine if the graph(s) are symmetric with respect to the x-axis, y-axis and/or the origin. **(6 points)**

a. $y = x^3 + 10x$

a._____

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

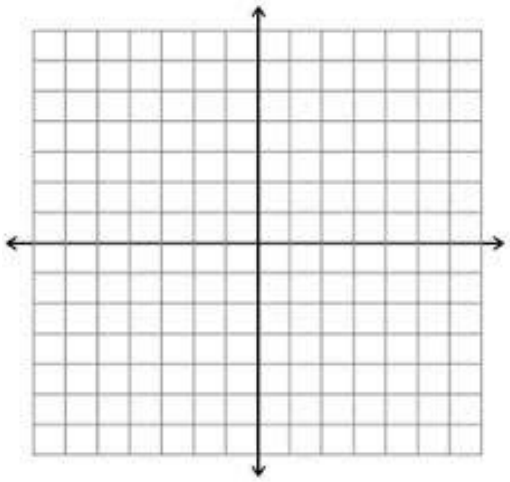
b._____

c. $y = (x-3)^2$

c._____

10. Sketch the graph of the equation and label the x and y intercepts. **(5 points)**

$2x - y = 6$



11. Find the midpoint between the points (1,1) and (9,7) **(2 points)**

11._____

12. **(6 points)** For the following function $f(x) = x^2 + 2x + 1$ find and simplify:

a. $f(x+h)$

a._____

b. $\dfrac{f(x+h) - f(x)}{h}$

b._____