Math 108 Exam #3
April 22, 2015

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

1. Evaluate the following $f(x) = 2x^2 - 2x - 2$ and $g(x) = x + 4$ **(16 points)**:

a. $(f \circ f)(3)$

b. $(g \circ f)(3)$

c. $(f \circ g)(x)$

d. $g \circ g(x)$

2. Find the inverse of the following functions: **(10 points)**

a) $f(x)=\dfrac{5+x}{3x+2}$

b) $h(x)=\sqrt{2x+3}, x\geq\dfrac{-3}{2}$

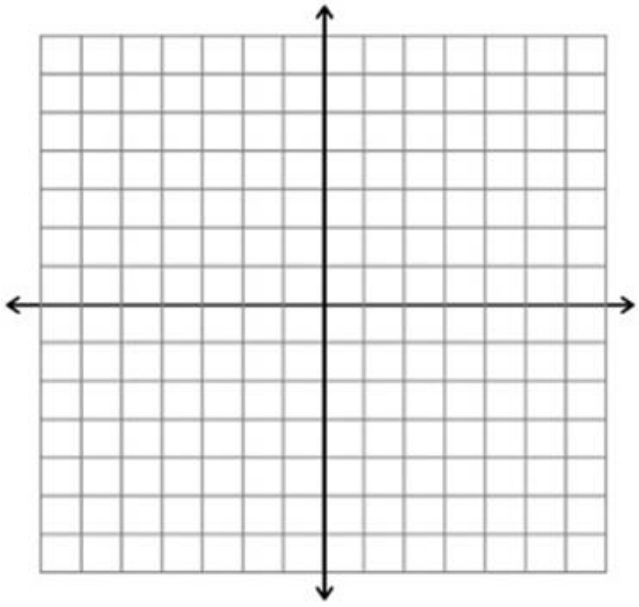
3. Use the given conditions to find the slope-intercept form of each non-vertical line.

   a) Parallel to $y=\dfrac{2}{3}x-5$ and passing through (4,7) **(3 points)**

   b. Perpendicular to $y=5x+3$ and passing through the point (-3,-5) **(3 points)**

4. Graph **(7 points)**

$y = 2(x-2)^2 + 1$



4)_____

5. Your wage is \$10 per hour plus \$0.75 for each unit produced per hour. So your hourly wage y in terms of the number of units produced x is $y = 10 + 0.75x$. **(6 points)**

a) Find the inverse of the function. What does each variable represent in the inverse function?

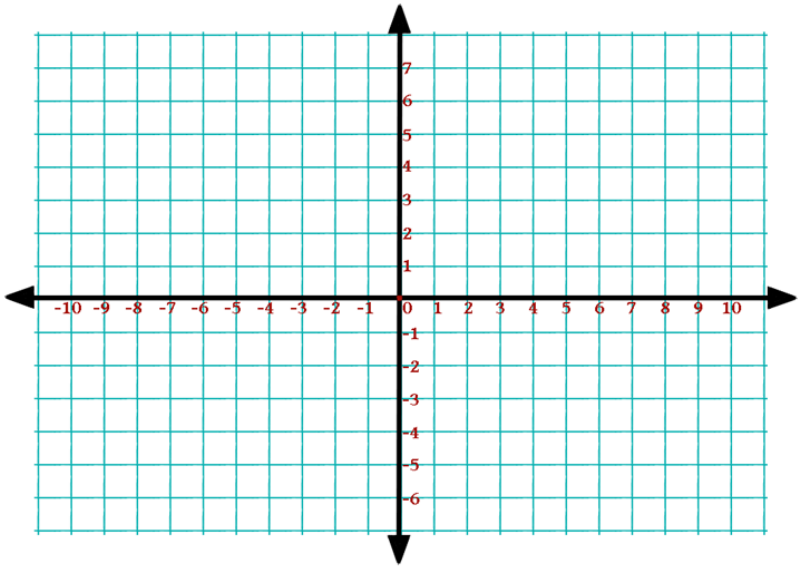
a)_____

b) Determine the number of units produced when your hourly wage is \$24.25.

b)_____

6. Find the function that is finally graphed after each of the following transformations is applied to the graph of $y = \sqrt{x}$ in the order stated. Then graph the function.

a) Shift up 1 units
b) Shift left 4 units
c) Reflect about the x-axis **(8 points)**



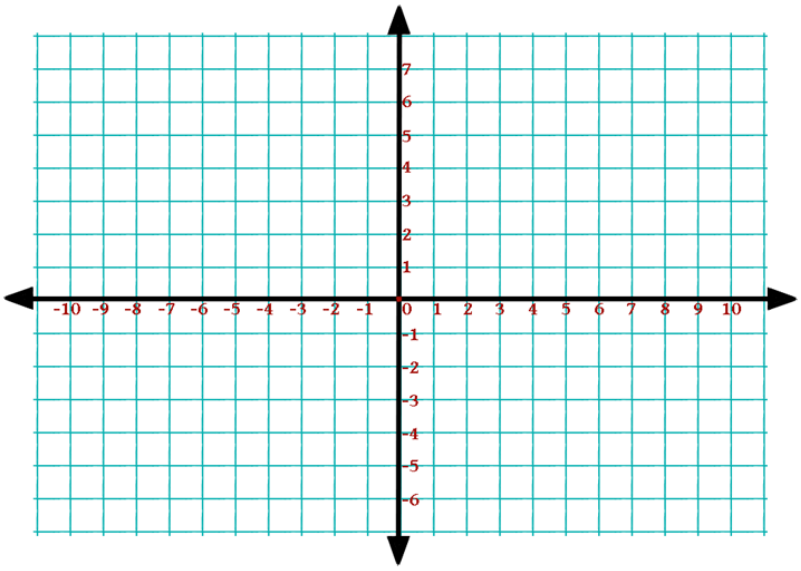
7. Find the line that passes through the points (-1,3) and (3,3). Be sure to put you answer in slope-intercept form. **(7 points)**

7)_____

8. For $F(x) = x^2 - 4x + 7$ evaluate $\frac{f(x+h) - f(x)}{h}$. **(8 points)**

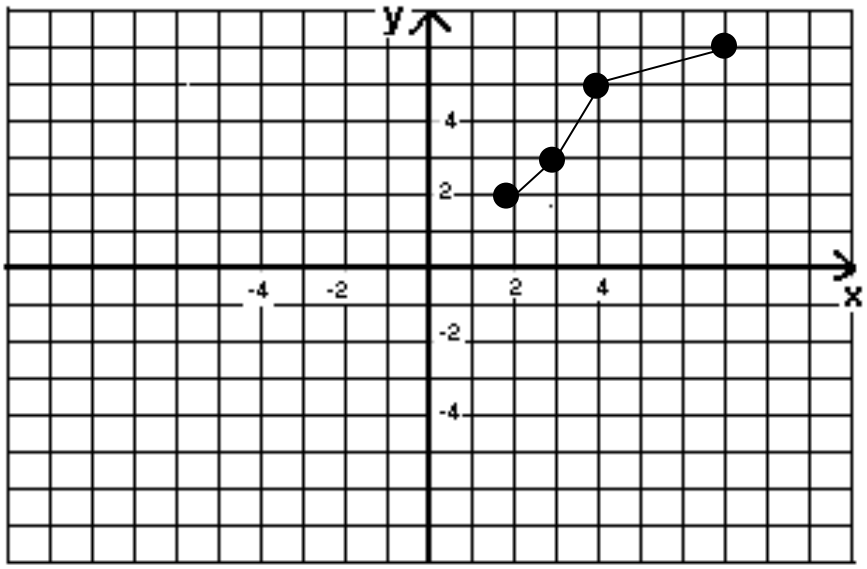
8)_____

9. Graph the following function $f(x) = 2x^2 + 8x + 7$: **(6 points)**



10. **(10 points)**

1. For the graph of *f(x)* given below sketch ***approximately*** a graph of $f^{-1}(x)$ on the same set of axes.



11. **(6 points)** If $f(x)=\frac{x}{x+1}, g(x)=\frac{1}{x}$ find the domain of**: (Note you do NOT need to do the combination of the two functions for full credit)**

a) $f \circ g(x)$

11a)_____

b) $g \circ f(x)$

11b) _____

12) **(10 points)** If $f(x)=\begin{cases} 2x+1 \text{ if } x<0 \\ 2x+2 \text{ if } x\geq 0 \end{cases}$ find:

a) f(-1)

b) f(0)

c) f(2)

d) If $f(x)=3$ then what does $x=$?

e) Graph f(x)