Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 1 – September 15, 2015

Directions: You will find 13 problems listed below. No notes/books/friends are allowed. Graphing calculator models above the level of a TI-84 plus are not allowed. You have one hour to complete this exam.

# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	TOTAL

1. (8 points) Find the union. Express answers in **interval notation** and on a **number line**:
   $(-3, 2] \cup [1, \infty)$

2. (6 points) Consider the graph of $h(x) = x^2$. Describe how the graph of $h(x + 4) - 5$ would look in terms of translations.

3. (8 points) Considser the two points $(4, -9)$ and $(-6, 7)$.
   (a) Find the midpoint of these points.

   (b) Find the distance between these points.

4. (10 points) Evaluate and complete the following function table for $f(t) = t^2 + 3Mt$, where M is some unspecified parameter. Show all work.

t	-2	-1	0	1	2
$f(t)$					

5. (6 points) Solve for x: $4(x-1)+7 = 7(x-2)-5$

6. (8 points) Is the function $f(x) = x^2 - x + 1$ even, odd, or neither? Use the definitions of even/odd to justify your answers.

7. (8 points) Given $f(x) = 4x - 7$, find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$.

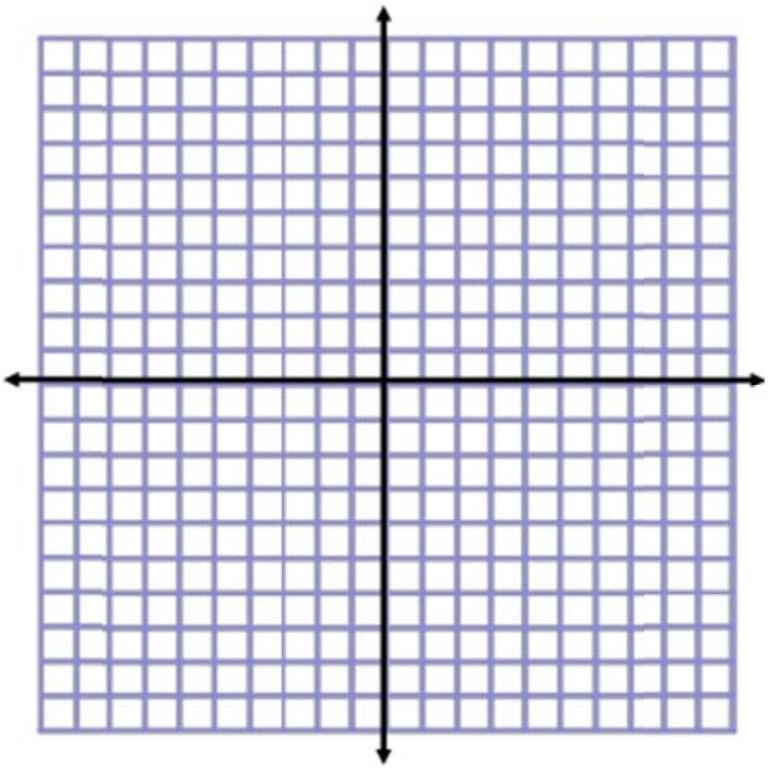
8. (8 points) Suppose the cost function for a certain product is given by $C(x) = 12x + 300$ and the revenue function for the product is given by $R(x) = 40x$. Find a formula for the following functions:

   (a) Profit Function, $P(x)$

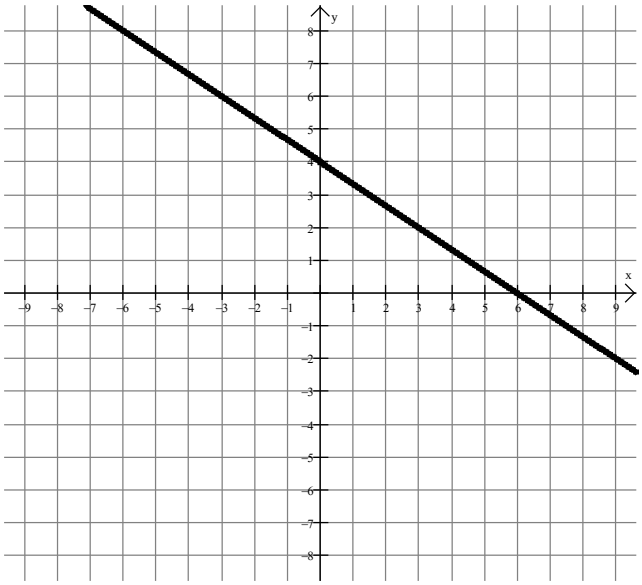
   (b) Average Cost Function, $\overline{C(x)}$

9. (10 points) In a controlled lab environment, some organisms exhibit constant growth over a specific time period. Suppose a certain organism starts out weighing 4 mg, and grows to 16 mg over a 24 hour time period. Find a linear model that describes the growth of the organism for $0 \leq t \leq 24$ hours.

10. (6 points) On the grid below, graph the relation $\{(x, y)|y > -1\}$.



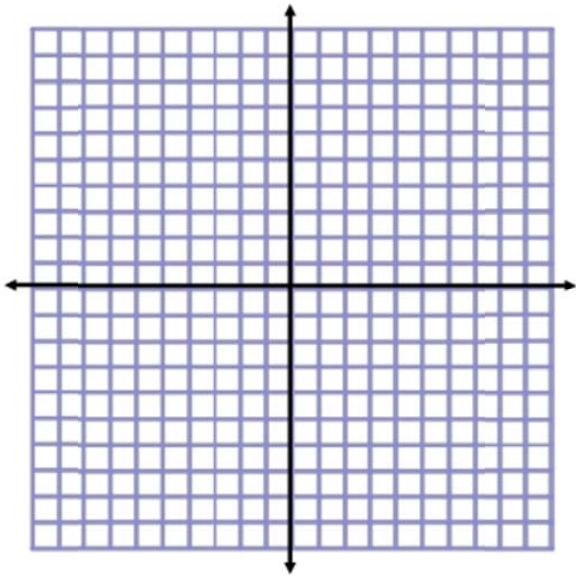
11. (6 points) Find a formula for the linear function given below:



12. (8 points) Find an equation of the line passing through $(-3, 5)$ and perpendicular to $4x - 2y = 8$.

13. (8 points) Graph the following piecewise function on the grid given below.

$$f(x) = \begin{cases} 2, & x \leq -4 \\ -x, & -4 < x \leq 5 \\ -3, & x > 5 \end{cases}$$



(a) Over what x-intervals is the graph of $g(x)$ increasing?

(b) Over what x-intervals is the graph of $g(x)$ decreasing?