**Name:**
**Recitation Instructor, Day, Time:**

# TRADITIONAL MATH 100 – Exam 1 – Spring 2017

**Directions:** You will find 15 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.

| Page 1 20 pts. | Page 2 20 pts. | Page 3 20 pts. | Page 4 20 pts. | Page 5 20 pts | TOTAL 100 pts |
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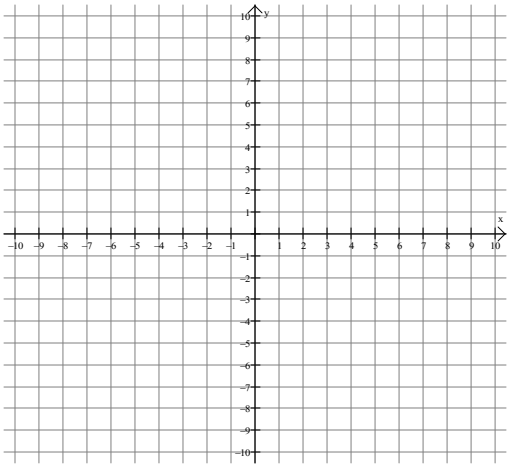
1. (6 points) Find the intersection. Express answers in **interval notation** and on a **number line**: $[-5, 7) \cup (-2, 13)$

2. (7 points) On the grid below, graph the relation $\{(x, y)|y \geq -4\}$



3. (7 points) Find the distance between the two points $(10, 3)$ and $(-5, 7)$.

4. (8 points) Consider $g(x) = 4x^2 - 3dx$, where $d$ is some external parameter. Answer the following:

   (a) Find $g(-1)$.

   (b) Find $g(2)$.

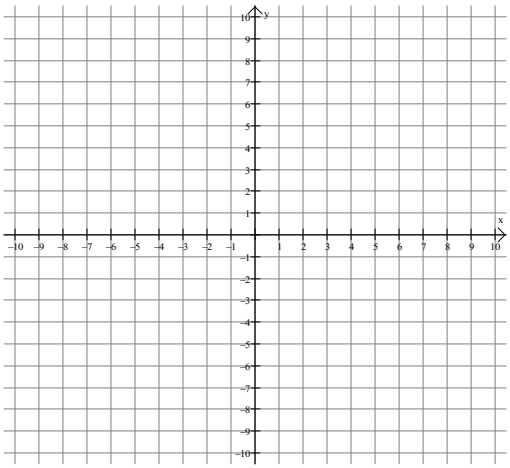
   (c) Find $g(3)$.

   (d) Find $g(-4)$.

5. (6 points) Solve for $x$ in the equation $-4(2x - 3) - 7 = 3(x + 5) + 4$.

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

7. (6 points) Graph $y = -\frac{3}{2}x + 6$ on the grid below. Include at least 6 points on your graph, including the intercepts.



8. (8 points) Given $f(x) = 3x + 7$, find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$.

9. (6 points) Suppose the total cost function for a certain product is given by $C(x) = 6x + 130$ and the revenue function for the product is given by $R(x) = 17x$. Find a formula for the following functions:

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

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

10. (6 points) Find the domain of the function $f(x) = \dfrac{3}{x-6}$.

11. (6 points) Find the midpoint of the points $(10, -4)$ and $(-9, 3)$.

12. (8 points) Consider $x + y = 6$. Is $y$ a function of $x$? Explain in COMPLETE SENTENCES, using terminology learned in class.

13. (8 points) Given $f(x) = 4x^2 + 6$ and $g(x) = x - 5$, find $(fg)(x)$.

14. (6 points) Consider the graph of $h(x) = x^3$. Describe how the graph of $h(x + 5) - 1$ would look in terms of translations.

15. (6 points) Consider the following piecewise function. Which of the statements given below are true? You may circle more than one choice if necessary.

$$f(x) = \begin{cases} 10, & x \leq -3 \\ x + 1, & -3 < x \leq 2 \\ -x, & x > 2 \end{cases}$$

(a) $f(-3) = 10$.
(b) $f(2) = 3$.
(c) $f(-3) = -2$.
(d) $f(-3) = 3$.
(e) $f(-6) = 6$.
(f) $f(4) = -4$.