Name:

Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 1 – September 2019

Directions: You will find 16 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	14	15	16	TOTAL

1. (6 points) Find the union. Express answers in **interval notation** and on a **number line**:
   $(5, 8) \cup [-3, 14]$

2. (6 points) Consider the graph of $h(x) = x^2$. Using appropriate terminology as discussed in lecture, describe how the graph of $h(x - 5) + 7$ would look.

3. (6 points) Find the distance between the two points $(0, 2)$ and $(-1, 6)$. Round to the nearest hundredth if using a decimal approximation. Answers left in radical format are always welcome too. Show all relevant work and when you use a formula, clearly (and correctly) write them down so we can assign partial credit when applicable.

4. (8 points) Consider $g(x) = -4x^2 + x$. Answer the following:

(a) Find $g(1)$.

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

(c) Find $g(4)$.

(d) Find $g(-3)$.

5. (6 points) Answer the following; no partial credit will be awarded on this problem.

(a) TRUE or FALSE: An odd function refers to a function whose graph is symmetric with respect to the origin.

(b) TRUE or FALSE: $f(x) = x^2$ is an even function.

6. (6 points) Solve for x: $4(x - 2) + 1 = 3(x + 2) - 11$

7. (6 points) Given $g(x) = 3x + 5$, find the difference quotient $\dfrac{g(x+h) - g(x)}{h}$.

8. (8 points) Suppose the cost function for a certain product is given by $C(x) = 15x + 2000$ and the revenue function for the product is given by $R(x) = 54x$. Find a formula for the following functions:

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

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

9. (6 points) In a controlled lab environment, some organisms exhibit constant growth over a specific time period. Suppose a certain organism starts out weighing 2 mg, and grows to 1.4 mg over a 24 hour time period. Find a linear model that describes the growth of the organism for $0 \le t \le 24$ hours.

10. (6 points) Given $f(x) = 3x^2$ and $g(x) = x - 7$, find $(fg)(-2)$.

11. (6 points) Graph a line with a slope of $-1/3$ passing through the point $(-1, 1)$. Include at least three points on your graph.
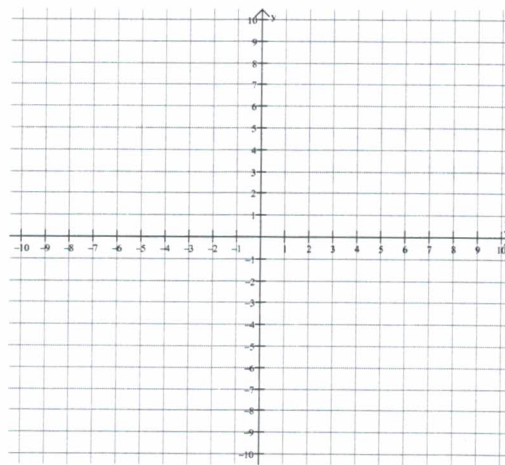
12. (6 points) Consider $x^2 + y = 16$. Is y a function of x? Explain in COMPLETE SENTENCES, using terminology learned in class.

13. (6 points) Find the midpoint between the two points $(7, 1)$ and $(-1, 4)$. If you use any formulas, clearly (and correctly) write them down so we can assign partial credit when applicable.

14. (6 points) On the grid below, graph the relation $\{(x,y)|x \geq -4\}$
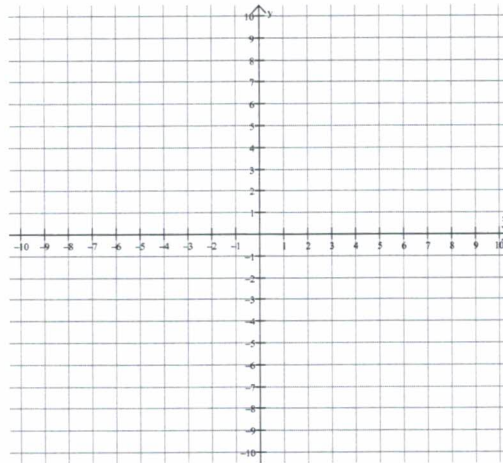
15. (6 points) Find an equation of the line passing through $(-3, 2)$ and parallel to $x - 2y = 6$.

16. (6 points) Consider the following piecewise function. Which of the statements given below are true? You may circle more than one choice if necessary.

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

(a) $f(2) = 4$.

(b) $f(2) = 6$.

(c) $f(-2) = 16$.

(d) $f(-3) = 4$.

(e) $f(-3) = 81$.

(f) $f(5) = 625$.