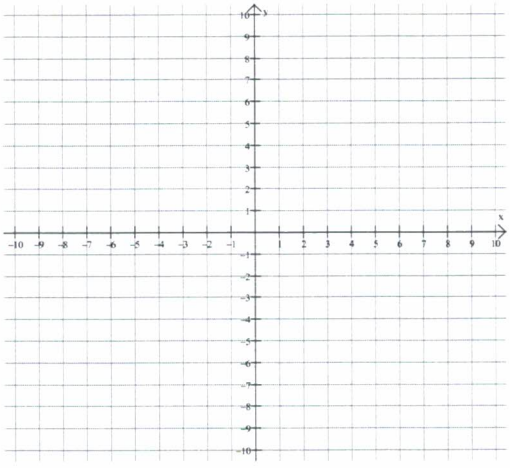
Name:
Recitation Instructor, Day, Time:

TRADITIONAL MATH 100 – Exam 1 – Fall 2021

1. (6 points) Find the union. Express answers in **interval notation** and on a **number line**:
   $(2, 10) \cup [-3, 5)$

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



3. (7 points) Find the distance between the two points $(3, 6)$ and $(2, -5)$.

4. (8 points) Consider $m(x) = x^2 + x - 9$. Answer the following:

   (a) Find $m(2)$.

   (b) Find $m(-3)$.

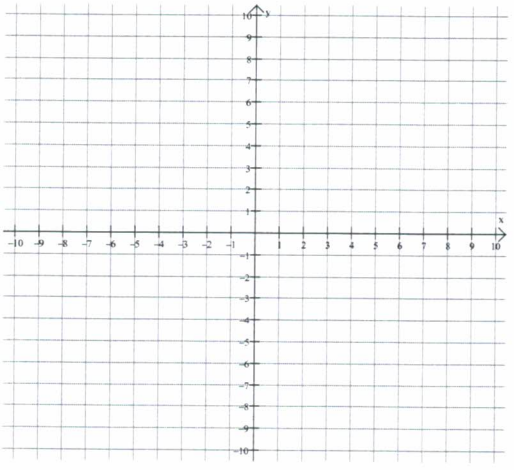
   (c) Find $m(a)$ where a is some generic input value.

   (d) Find $m(x + 1)$, and expand completely.

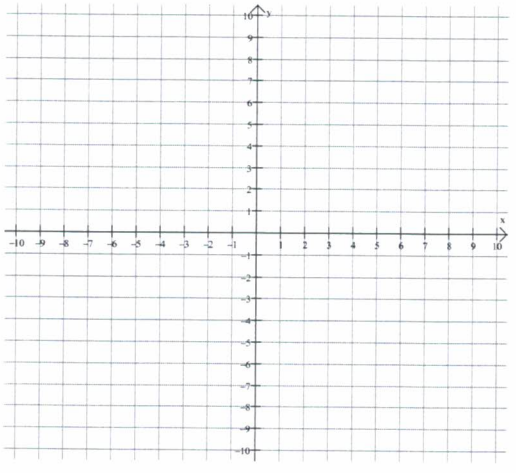
5. (6 points) Solve for x in the equation $4(6x - 1) - 7 = 2(x - 5) + 3$.

6. (6 points) Is the function $f(x) = x^2 + x$ even, odd, or neither? Use the definitions of even/odd to justify your answers. (Answers that only show a graph will only receive partial credit).

7. (6 points) Graph $y = -\frac{1}{3}x - 1$ on the grid below. Include at least 4 points on your graph, including the intercepts. Please include a table of ordered pairs as part of your work.



8. (6 points) Graph $y = -x^2 + 4$ on the grid below. Include at least 6 points on your graph, including the intercepts. Please include a table of ordered pairs as part of your work.



9. (6 points) Suppose the total cost function for a certain product is given by $C(x) = 60x + 1100$ and the revenue function for the product is given by $R(x) = 98x$. 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 $f(x) = \dfrac{3}{5x - 1}$.

11. (6 points) Find the midpoint of the points $(-11, 5)$ and $(8, -2)$.

12. (8 points) Consider $x = 7 - y$. Is y a function of x? Explain in COMPLETE SENTENCES, using terminology learned in class.

13. (8 points) Given $f(x) = x^2 - 4x + 1$ and $g(x) = 3x + 1$, find $(fg)(x)$.

14. (8 points) Given $h(x) = 5x^2 + x - 1$ and $k(x) = -x + 2$, find $(h + k)(2)$.

15. (6 points) Consider the graph of $h(x) = x^2$. Describe how the graph of $h(x - 2) + 5$ would look compared to $h(x)$.

16. (6 points) Consider the function $k(x) = (x - 3)^2 - 4$.

    (a) Find the y-intercept of $k(x)$.

    (b) Find the x-intercept of $k(x)$.