Exam 1A

NAME:

1. (2 points) Consider the following equation.

$$2 - x^2 = x^3$$

Is the number $x = -1$ a solution to this equation? Show the steps that support your answer.

2. (8 points) Solve each equation.

   (a) $5x - 2 = 5$

   (b) $3(x - 1) = 5 - 2(3x + 4)$

   (c) $-4(x - 2) = 2 + 2(3 - 2x)$

3. (11 points) Use factoring to solve each of the following quadratic equations.

(a) $x^2 - 25 = 0$

(b) $x^2 + 15 = 8x$

(c) $9x^2 - 4x = 0$

(d) $12x^2 - 5x - 3 = 0$

4. (9 points) Use completing the square to solve $x^2 + 22 = -10x$.

5. (10 points) Solve each equation. Remember to take steps to address the possibility of false solutions.

(a) $5 = \sqrt{3 - n}$

(b) $\sqrt{3x + 10} = -16$

(c) $x = \sqrt{30 - x}$

6. (12 points) Solve each inequality. Write your answer in interval notation, and make a number line that shows a picture of your solutions.

(a) $3(y + 2) - 5y \leq -4$

(b) $x + 1 > x + 2$

(c) $|4x - 7| - 10 \leq -5$

7. (10 points) Suppose that copper costs $7.50 per kilogram, and tin costs $10.00 per kilogram. We want to make 16.5 kilograms of bronze by combining the two metals. The cost of the mixture should be $8.50 per kilogram. How much of the two metals should we use?

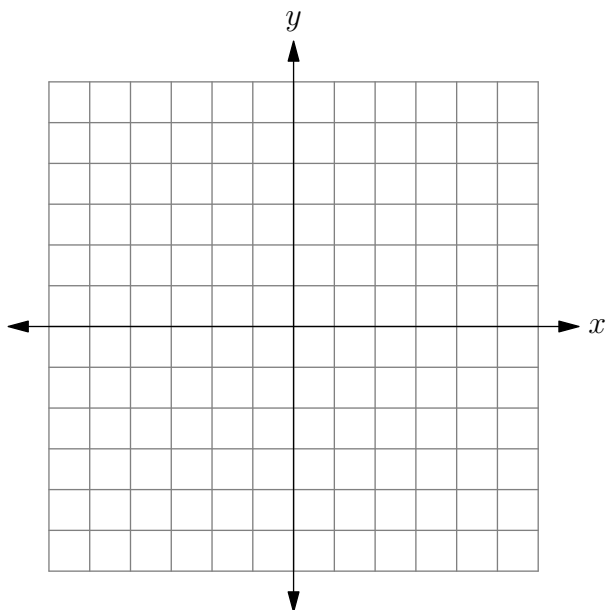8. (2 points) Find the equation of the line with slope $-7/4$ and y-intercept 12.

9. (13 points) Consider the points $(2, -4)$ and $(-4, 4)$.
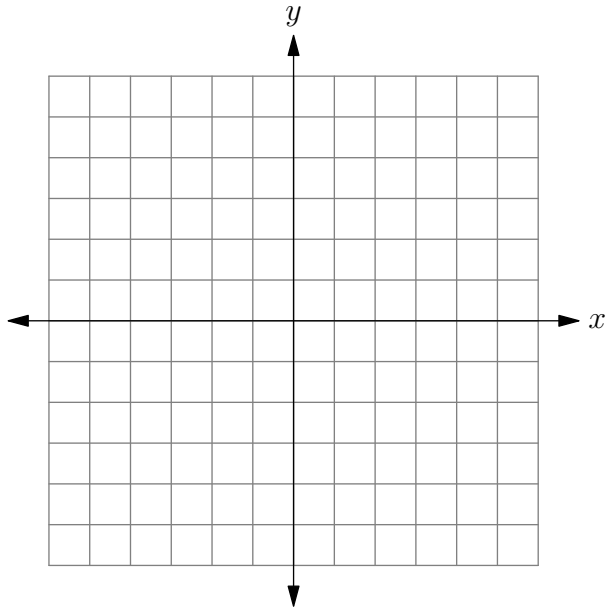
(a) Find the distance between the points.

(b) Find the slope of the line that contains these points.

(c) Find the equation of the line that contains these points.

(d) Graph the line that you found in part (c).
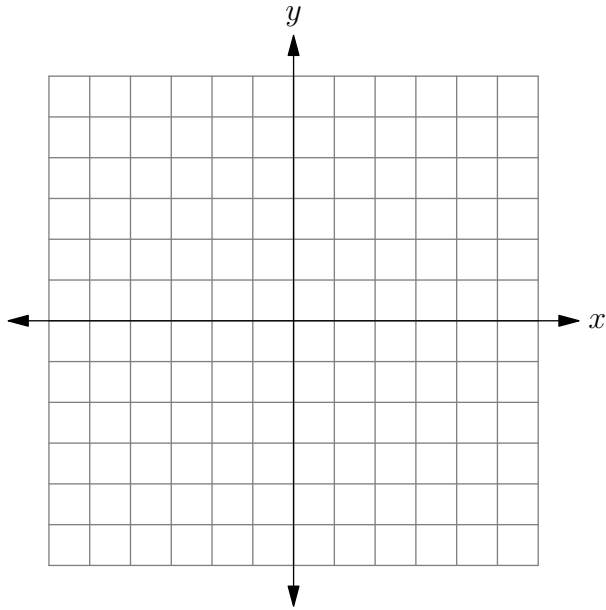
10. (7 points) (a) Graph the line $3x - 5y = -10$.

(b) On the same set of axes, sketch a graph of the line that is parallel to your line from part (a) and that passes through the point $(-1, -4)$.

(c) Write the equation of the parallel line that you graphed in part (b).

11. (7 points) (a) Graph the line $y = -3$.

(b) On the same set of axes, sketch a graph of the line that is perpendicular to your line from part (a) and that passes through the point $(-1, 3)$.

(c) Write the equation of the perpendicular line that you graphed in part (b).

12. (4 points) Find the equation of the circle that has center $(-200, 450)$ and radius 100.

13. (5 points) Graph the equation $(x-3)^2 + (y+1)^2 = \dfrac{25}{4}$.