HW #2

Kerry Ojakian's MTH 30 Class

Due Date: Tuesday October 28 (beginning of class)

General Instructions:

- Homework must be stapled, be relatively neat, and have your name on it. All answers and work should be on this sheet.

- Use tutors, work with other students, but ... don't copy!

The Assignment

1. Solve these absolute value equations:

   (a) $|x - 5| = 20$ (b) $|4x + 7| = 15$

2. Solve these absolute value inequalities:

   (a) $4|3x - 5| < 40$ (b) $|4x + 1| + 7 \geq 12$

3. Show that $f(x) = -3x + 1$ and $g(x) = \dfrac{x - 1}{-3}$ are inverses.

4. Find the inverse of the function $g(x) = \dfrac{1}{x} + 1$.

5. Consider the function f given by the following table.

x	2	4	6	10	15	17
$f(x)$	3	4	13	2	6	14

Use the table to evaluate each.

(a) $f(2)$ (b) $f(10)$

(a) $f^{-1}(14)$ (b) $f^{-1}(4)$

(a) $f^{-1}(2)$

6. Find the slope and y intercept of the lines.

(a) $x - 3y = -3$ (b) $x + y = 4$

7. Find the slope of the line from the given points.

(a) $(1, 2)$ and $(3, 6)$ (b) $(0, 5)$ and $(2, 1)$

8. Graph each equation.

    (a) $y = 3x + 1$ (b) $y = 2x - 1$

9. Graph the following function.
$h(x) = \frac{1}{2}x + 1$

10. Consider the linear equation $f(x) = (3/2)x - 6$. Find the slope of a line parallel to f. Find the slope of a line perpendicular to f.

11. Find the equation of the line passing through the point $(1, 3)$ that is parallel to the line with equation $3x + 2y = 5$.

12. Write an equation for a line perpendicular to $f(x) = 3x + 4$ and passing through the point $(3, 1)$.

13. Find the point of intersection between the lines, if it exists:
$2x - 3y = 12$ and $5y + x = 30$.

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14. Suppose we have a scatter plot of some data comparing hours spent studying with grade on an exam, where hours (t) is the independent variable. Suppose the best-fit line turns out to be this: $G(t) = 20 + 15t$

   (a) According to this best fit line, what will your grade be if you do not study at all?

   (b) How much do you need to study to get 100?

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15. Consider $y = x^2 + 5x + 6$.

   (a) Find all intercepts.

   (b) Find the point on the graph with maximum y (or explain if none).

   (c) Find the point on the graph with minimum y (or explain if none).

   (d) Graph the equation.

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16. Write the parabola $h(x) = (x-2)^2 + 1$ in in general form.

17. Write the parabola $g(x) = x^2 - 12x + 32$ in vertex form.

18. For the quadratic function $f(x) = 2x - x^2 - 2$

    (a) Find its vertex

    (b) Find its x- and y-intercepts.

    (c) Give the equation of the axes of symmetry.

    (d) Draw the graph.

    (e) Determine its domain and range.

19. The number of people (P) infected t days after a flu outbreak is modeled by $P = -t^2 + 100t + 20$.

    (a) How many days after outbreak is the maximum number sick?

    (b) What is that maximum number of people infected at once?