1. How do you solve equations if they have parentheses? Write a description of how you remove the parentheses in each type of problem shown below.

a. 3(x + 1) = -12 b. 5 - 2(x - 3) = 11 c. 12 - (x + 4) = -20

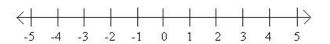
2. How do you solve equations if they have variables (x) in different locations in the equation? Write a description of how you combine variables in each type of problem shown below.

a. 3x - 7 = 5x + 21 b. 4x - 2(x + 3) = -10 c. -2x + 5 = 3x - 25

3. Consider the inequality: $5x + 1 \ge -14$.

- a. Show that x = 4 is a solution to the inequality.
- b. Show that x = -4 is not a solution to the inequality.
- c. Solve the equation 5x + 1 = -14 for x. Is this answer a solution to the inequality above? Explain why or why not.
- d. Explain why the solution to part (c) is the SMALLEST possible solution to the inequality $5x + 1 \ge -14$.

e. Determine 3 three other solutions to the inequality $5x + 1 \ge -14$. Mark all of the solutions you have found so far on the number line below:



- f. Use your answer to parts (d) and (e) to show all of the solutions on the number line above. Write the solutions as an inequality.
- 4. For each inequality below,
 - i. Find the boundary point.
 - ii. Choose and test a point.
 - iii. Use the boundary point and your test point to shade the solutions on a number line.
 - iv. Write the solution as an inequality (using <, >, \leq , \geq).
- a. $10 3x \le -20$ b. 4 2(x+1) > 6 c. -5x + 13 < 5(2 x)
- d. 1 (2x+3) > 8 e. $10x 3 \ge 7x + 3(x-1)$

- Mason is working during April as a salesman at a computer retail store. He is paid a flat salary of \$500 plus \$12 for every computer he sells. He finds that he must earn at least \$1500 to pay for his April expenses.
 - a. Can Mason cover his monthly expenses if he sells 20 computers? If he sells 75 computers? Show how you found your answer.
 - b. Write and solve an inequality to represent Mason's situation.
 - c. What does your solution tell you about Mason's job and how many computers he sells?

- 1. **<u>Challenge</u>**: Consider the inequality $x^2 + 5x 50 \le 0$.
 - a. Use Factoring the Zero Product Property to find the boundary points for the inequality.
 - b. Choose 3 test points, one smaller than the least boundary point, one between the two boundary points and one larger than the greatest boundary point.
 - c. Use your results to parts (a) and (b) to show all of the solutions on the number line below. Write the solutions as an inequality.
 - d. Use a similar strategy as above to find the solutions to the inequality $5(x-2)^2 + 3 > 48$.

- 2. **Challenge**: A model rocket is launched from the ground with an initial velocity of 200 feet per second. The function that describes the rocket's height over time (x) is $h(x) = -16x^2 + 200x$. The rocket will not be visible above 500 feet because of clouds.
 - a. Write an inequality to describe when the rocket cannot be seen.
 - b. Solve the inequality and explain what this tells you about the rocket's path.