Name:_____ Period:_____

HW 1-3 HONORS: Checkerboards Homework

Solve each equation or inequality. **Justify** your steps using the properties of **equality** or **inequality**.

1.

$6x + 3 = 15$	Justification

2.

$3x - 10 = 2$	Justification

3.

$8x - 10 = x + 11$	Justification

4.

$5p - 2 = 32$	Justification

5.

$10(y + 5) = 10$	Justification

6.

$3x + 9 = 44 - 2x$	Justification

Solve each equation or inequality. **Justify** your steps using the properties of **equality** or **inequality**.

7.

$2x - 4 \leq 10$	Justification

8.

$5 - 4x \leq 17$	Justification

9.

$2(x - 3) \leq 3x - 2$	Justification

10.

$\dfrac{x}{-3} > -\dfrac{10}{9}$	Justification

Solve the following inequalities. You do not need to justify your steps.

11. $5(4x + 3) \geq 9(x - 2) - x$

12. $\dfrac{2}{3}x - \dfrac{1}{2}(4x - 1) \geq x + 2(x - 3)$

Henry and Serena have been working on equations and inequalities. The following questions are some things that Henry and Serena have been thinking about Your job is to decide who is right and give a mathematical explanation of your reasoning.

13. Henry and Serena are assigned to graph the inequality $x \geq -7$.
      Henry thinks the graph should have an open dot at -7.
      Serena thinks the graph should have a closed dot a -7.
      Who is correct? Why?

14. Henry and Serena are looking at the problem $3x + 1 > 0$.
      Serena says that the inequality is always true because multiplying a number by three and then adding one to it makes the number greater than zero.
      Is she right? Explain why or why not.

15. Henry is thinking hard about equations and inequalities and comes up with this idea:
      If $45 + 47 = t$, then $t = 45 + 47$. So, if $45 + 47 < t$, then $t < 45 + 47$.
      Is he right or wrong? WHY?

16. Serena is checking her work with Henry and finds that they disagree on a problem.
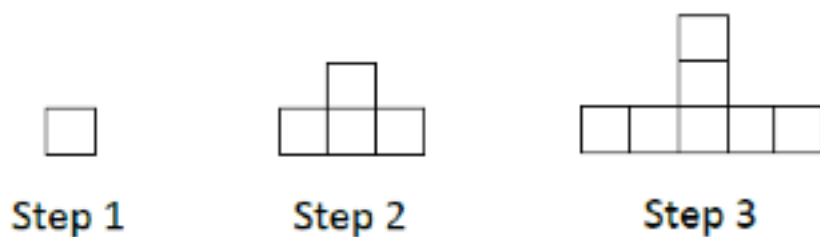   Here is what Serena wrote:
$$3x + 3 \leq -2x + 5$$
$$3x \leq -2x + 2$$
$$x \leq 2$$
      Is she right? Explain why or why not?

Use the following diagram to answer questions 17 – 19.

Step 1   Step 2   Step 3

17. Each square represents one tile, how many total tiles are in Step 5? Step 6?

18. How can you determine the number of tiles in Step 25? Explain in words.

19. Write a rule to predict the total number of tiles for any step. Explain how your rule relates to the pattern.

20.

Building More Checkerboard Borders
A Develop Understanding Task

As the tile workers started to look more deeply into their work they found it necessary to develop a way to quickly calculate the number of colored border tiles for not just square arrangements but also for checkerboard borders to surround any L X W rectangular tile center.

Find an expression to calculate the number of colored tiles in the two row checkerboard border for any rectangle. Be prepared to share your strategy and justify your work. Create models to assist you in your work.