Name: Period: Score: / = %=

Assignment 1-3

Sec 1 H — Equations and Inequalities — Unit 1

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

1.

$6x+3=15$	Justification
$-3 \quad -3$	Subtraction Property of Equality
$\frac{6x}{6}=\frac{12}{6}$	Division Property of Equality
$x=2$	

2.

$3x-10=2$	Justification

3.

$8x-10=x+11$	Justification
$-x \quad -x$	Subtraction Property of Equality
$7x-10=11$	
$+10 \quad +10$	Addition Property of Equality
$\frac{7x}{7}=\frac{21}{7}$	Division Property of Equality
$x=3$	

4.

$5p-2=32$	Justification

5.

$10(y+5)=10$	Justification
$10y+50=10$	Distributive Property
$-50 \quad -50$	Subtraction Prop. of Eq.
$\frac{10y}{10}=\frac{-40}{10}$	Division Property of Equality
$y=-4$	

6.

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

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

7.

$2x-4 \le 10$	Justification
$+4 \quad +4$	Addition Prop. of Inequality
$\frac{2x}{2} \le \frac{14}{2}$	Division Property of Ineq.
$x \le 7$	

8.

$5-4x \le 17$	Justification

9.

$2(x-3) \le 3x-2$	Justification
$2x-6 \le 3x-2$	Distributive Prop.
$+6 \quad +6$	Addition Prop. of Ineq.
$2x \le 3x+4$	
$-3x \quad -3x$	subtraction Prop. of Ineq.
$-1x \le 4$	Division Prop of Ineq.
$\frac{-1x}{-1} \le \frac{4}{-1}$	
$x \ge 4$	

10.

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

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

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

$20x+15 \ge 9x-18-x$

$20x+15 \ge 8x-18$

$-8x \quad -8x$

$12x+15 \ge -18$

$-15 \quad -15$

$\frac{12x}{12} \ge \frac{-33}{12}$

$x \ge \frac{-33}{12}$

reduce! $x \ge \frac{-11}{4}$

12. $\frac{2}{3}x - \frac{1}{2}(4x-1) \ge x + 2(x-3)$

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?

Serena. $\geq$ means greater than or equal to
And the "equal to" part means use a CLOSED Dot.

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?

Wrong. $45+47<t$
and $t>45+47$ are the same.
He forgot to FLIP the inequality sign.

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?