Chapter 4 Guide Notes

A) Prior Knowledge

1) Solving algebraic equations by balancing:

a) You can use _____ _____ to solve an equation. When you do, keep the equation balanced by performing _____ , _____, _____, or _____ by the same non zero number on both sides.

b) Also remember,

$2 - 2 = 0$ and $-2 + 2 = 0$

$$\frac{2}{3} \div \frac{2}{3} = \frac{2}{3} \times \frac{3}{2} = \frac{6}{6} = 1$$

c) **Equivalent Equations** =

B) Solving One-Step Equations

Solve each equation. Check your solution.

1) $x + 9 = 3$

2) $x - 2 = 11$

3) $-4x = -32$

4) $\frac{3}{5}x = -9$

5) $-\frac{2}{7}x = 6$

6) $\frac{56}{16} = \frac{x}{2}$

7) $\frac{y}{9} = \frac{35}{15}$

C) Two-Step Equations
Do the order of operations backwards!!!
PEMDAS → SADMEP

1) $\frac{x}{2} + 3 = 12$

2) $5y - 7y = 6$

3) The value of y is 7 more than 2 times the value of x. Find x when $y = 15$.

4) You have some change in your pocket. After you gave your friend \$0.40, you had \$1.10 left. Write an equation for the amount you originally had in your pocket. Then solve.

D) Multi-Step, With Variables on Both Sides of the Equation

Solve Each.

1) $8x - 3x - 10 = 20$

What is the Distributive Property?

Distributive Property =

2) $7x + 2(x + 6) = 39$

3) $5(4x+1) - 3(5x - 6) = 38$

4) $\frac{3}{2}(3x + 5) = -24$

5) $7 - 8x = 4x - 17$

6) $6x - 5 = \frac{1}{4}(16x + 60)$

7) $8y - 6 = \frac{2}{3}(6y + 15)$

E) Solving One-Step Inequalities
Solution Set =

Inequality Symbols

$1 > -2$	Read as "1 is **greater than** 2"
$3 < 5$	Read as "3 is **less than** 5"
$X \geq 3$	Read as "X is **greater than or equal to** 3"
$X \leq 4$	Read as "X is **less than or equal to** 4"

Solve the inequality. Graph your solution.

1) $x - 6 > -3.5$

2) $-8 \leq 8 + y$

3) $-1\frac{1}{3} \leq p - 8\frac{1}{3}$

4) $\frac{x}{4} < 5$

5) $-6x < 18$

6) $\frac{x}{-6} > 7$

F) Solving Multi-Step Inequalities
Solve the inequality. Then Graph.

1) $-7x + 2 < -5$

2) $\frac{1}{3}(3x + 6) \geq -1$

3) $14x + 5 < 7(2x - 3)$

4) $12x - 1 > 6(2x - 1)$

Final Notes:

- Dividing or Multiplying by a negative flips the inequality sign
- $\leq$ and $\geq$ are closed circles on the number line
- $<$ and $>$ are open circles on the number line
- Untrue or false inequalities without variables are “no solution”
- True and without variables inequalities are “all real numbers”