Algebra Notes 1.4

An equation is a mathematical sentence formed by placing the symbol = between two expressions.

An inequality is a mathematical sentence formed by placing the symbol <, ≤, >, ≥ between two expressions.

An open sentence is an equation or inequality that contains an algebraic expression. For example,

x + 6 =8 is and open sentence and 2 + 6 = 8 is not.

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| Symbol | Meaning | Associated Words |
| = | Is equal to | The same as |
| $$<$$ | Is less than | Fewer than |
| $$\leq $$ | Is less than or equal to | At most, no more than |
| $$>$$ | Is greater than | More than |
| $$\geq $$ | Is greater than or equal to | At least, no less than |

Combining inequalities: x > 5 and x < 11 can be written as 5 < x < 11

Example 1: a. The difference of four times a number K and 3 is 13. 4k – 3 = 13

 b. The product of 8 and a number m is at least 32. 8m ≥ 32

 c. A number z is no less than 3 and no more than 15. 3 ≤ z ≤ 15

A solution of an equation or inequality is a number that makes an equation or inequality true when substituted in for a variable. For instance, for x + 7 = 11, 4 is the solution of the equation.

Example 2: Is 9 a solution?

1. 18 – 2x = 0 18 – 2(9) = 0 0 = 0 (Yes!)
2. 7p – 53 = 9 7(9) – 53 = 9 10 ≠ 9 (No!)
3. 8m + 5 > 79 8(9) + 5 > 79 77 > 79 (No!)
4. 3w – 20 ≤ 30 3(9) – 20 ≤ 30 7 ≤ 30 (Yes!)

Example 3: a. x + 7 = 13 Guess 6 6 + 7 = 13 13 = 13 (Yes!)

 b. 35 – z = 8 Guess 27 35 – 27 = 8 8 = 8 (Yes!)

 c. 7n = 56 Guess 8 7(8) = 56 56 = 56 (Yes!)

 d. $\frac{32}{a}$ = 4 Guess 8 $\frac{32}{8}=4$ 4 = 4 (Yes!)

Example 4: The last time that you rented a stand up paddle boarding you had a coupon for $15 off and paid $35 for 5 people. How much is a regular rental per person?

5p - $15 = $35

Use mental math to figure out 5p = $50.

Use mental math again to figure out p =$10 rental each

Example 5: A water polo player scored 116 point last season. If she plays in 20 games will 6 points a game be enough to beat last year’s total?

Is 20 games times 6 points is greater than 116? 20(6) > 116 120 > 116 (Yes!)