**Notes - Writing and Simplifying Expressions (Key)**

**Key Vocabulary**

**Algebraic Expression:** A mathematical phrase that can include numbers, variables, and operation symbols (ex. 3y + 7)

**Coefficient:** A number that is multiplied by a variable (ex. **5**x)

**Constant:** A value that does not change (ex. 4)

**Distributive Property:** For every real number a, b, and c: a(b + c) = ab + ac and a(b-c) = ab – ac (ex. 4(x + 3) = 4x + 12)

**Equivalent Expression:** Expressions that have the same value for all variables

**Integers:** Positive and negative whole numbers (ex. 22, -3)

**Like Terms:** Have identical variables; that is, they have the same variable to the same exponent. Constants are like terms as well. (ex. 6x2 and 99x2 are like terms)

**Order of Operations:**  Parenthesis, Exponents, Multiplying and Dividing (left to right), Adding and Subtracting (left to right) **PEMDAS!**

**Simplify:** To write an expression in simplest form (combine all like terms)

**Substitute:** To replace a letter with a number or algebraic expression

**Term:** “parts” in an expression that are added or subtracted (ex. 4x2 + 3 -> 4x2 and 3 are terms)

**Variable:** a letter that represents an unknown number

**Writing Expressions**

**What are some key words that represent the following operations?**

**Tips to remember**

**\*When multiplying a number and a variable, the number is written first. For example x times 5 is 5x not x5.**

**\*Don’t use subtraction in the wrong order!**

**“The difference of 5 and t” and “5 decreased by t” are translated as 5 – t.**

**“5 less than t” and “5 subtracted from t” are translated as t – 5.**

**Multiplication**

Quotient

Divided by

Times

Product

Multiplied by

Minus

Difference

Decreased by

Less than

Plus

Sum

Increased by

More than

**Subtraction**

**Addition**

**Division**

**Writing Expressions**

**Write the following expressions in algebraic form.**

|  |  |
| --- | --- |
| 1. 9 more than c c + 9 | 2. b minus 4 b - 4 |
| 3. the quotient of z and 9 z/9 | 4. the total of n and 40 n + 40 |
| 5. the sum of 8 and m 8 + m | 6. x divided by 5 x/5 |
| 7. the difference of h and 7 h - 7 | 8. 23 less than p p - 23 |
| 9. the product of g and 2 2g | 10. 77 plus twice v 77 + 2v |
| 11. two times r increased by 12 2r + 12 | 12. 3 times j decreased by 12 3j - 12 |

**Simplifying Expressions**

**Identify the coefficient and constant(s) in expressions listed below:**

|  |  |
| --- | --- |
| 1. 8x + 9 – 3x | 2. 17 – 2a + 5a - 1 |
| Coefficient(s): 8, -3 | Coefficient(s): -2, 5 |
| Constant(s): 9 | Constant(s): 17, -1 |

**Steps to Simplifying an Expression:**

1. **Distribute to get rid of any parenthesis**
2. **Combine like terms**
3. **Put terms with variables in abc order and constants at the end.**

**Simplify the following expressions:**

|  |  |
| --- | --- |
| 1. 3(4x – 5)  12x – 15 | 2. -4(x – 2)  -4x + 8 |
| 3. 7(b – 10)  7b - 70 | 4. 2(b-3) + 4(2b + 2)  10b + 2 |
| 5. 5(-3y + 5)  -15y + 25 | 6. –(7y – 4)  -7y + 4 |
| 7. -5(-8g – 3) – (5g + 3)  35g + 10 | 8. 4(2a + b) – 3(3a – 4b)  -a + 16b |