Name: _____ Period: _____ Date: _____

An Introduction to Equations Guide Notes

EQUATION is a mathematical sentence that uses an equal sign (=). It can be used to represent the relationship between two quantities that have the same value.

TYPES:

A. **True equation**: If the expressions on either side of the equal sign are equal.

B. **False equation**: If the expressions on either side of the equal sign are not equal.

C. **Open Sentence**: If the equation contains one or more variables, and maybe a true or false depending on the values of its variables.

Sample Problem 1: Tell whether each equation is true, false, or open. Explain.

A. $12 + 18 = 15 + 15$

B. $5 \cdot 7 = 34$

C. $3x + 12 = 48$

SOLUTION OF AN EQUATION containing a variable is a value of the variable that makes the equation true.

Sample Problem 2: Tell whether the given number is a solution of each equation.

A. Is $x = 6$ a solution of the equation $x - 14 = 5$?

B. Is $y = \frac{1}{2}$ a solution of the equation $4y + 2 = 10$?

C. Is $z = 5$ a solution of the equation $8z - 6 = 50$?

Sample Problem 3: Find the solution of each equation.

A. $8b - 3 = 13$

B. $-16 = 26 - 21x$

C. $-8z - 12 = -4$

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Sample Problem 4: Use a table to find the solution of each equation.

A. $7x + 10 = 45$

B. $7x + 14 = 21$

C. $12 = 4x + 8$

Sample Problem 5: Use a table to find two consecutive integers between which the solution lies.

A. $8x - 20 = 37$

B. $3x + 4 = 36$

C. $8 = 3 - 2x$

Sample Problem 6: Find the solution of each equation using mental math or table. If the solution lies between two consecutive integers, identify those integers.

A. $3x - 9 = 14$

B. $17 = 9 + (-x)$

C. $8 = 21 - 7x$

TRANSLATING SENTENCES TO EQUATIONS:

- Use variables to represent the unspecified numbers or measures referred to in the sentence or problem.
- Write the verbal expressions as algebraic expressions.

Verbal Expressions that suggest the **equals sign**:

Sample Problem 7: Write an equation for each sentence.

A. Fifteen times the number a is equal to four times the sum of b and c.

B. Three times x subtracted from 57 equals 29.

C. The difference of 10 and a number is 5.