Equation Study Guide

On this test you need to know how to

- Evaluate algebraic expressions applying the order of operations as well as integer rules.
- Solve equations—which again means you need to know and apply integer rules, how to combine like terms, distribute, and the process for solving equations.
- Solve absolute value equations
- Write and solve equations based on word problems.
- Identify and write equivalent expressions (multiple representations) (ability to distribute & combine like terms—etc…)

Integer Rules:

Circle the sets of integers that you would add; draw a box around ones that you would subtract.

Write the sum or difference—your answer—to each problem in the space provided under each one.

-5 -10 4 – 3 9 + 10 -4 + 2 -8 – 2 1 – 2 -3 + 5 2 – 6 7 + 8

_____ _____ _____ _____ _____ _____ _____ _____ _____

Draw the graphic organizer that helps you with signs for multiplying and dividing with integers.

Combining Like Terms:

In each set of terms below, circle the like terms.

5x 6y 3x 3 $5x^3y$ 3x $3xy^3$ $5xy^3$ 4 4x 9y 9z 3

Simplify the problems below by combining like terms. (Helps to draw a table.)

$5x^2 + 3 – 2x^2 + 10 – 9x$ 4xy – 3y + 2 -10xy + 2 5x + 3 -2x – 3 + 9x

Distributing:

A number directly beside ( ) indicates all terms inside need to be multiplied by the number outside of the ( ).

-3 (4x – 5) -(4y^2 + 2y – 1) 7(2w – 3x + 4) -2x (x^2 – 3x + 5)

_____ _____ _____ _____

Solving Equations:

Remember when you evaluate to get an answer, you follow the order of operations (GEMDAS); when you solve equations, you already know what it equals. You are trying to get back where you started—it's a mystery! You get back to where you started by following the order of operations in reverse (SADMEG).

There are three things you must consider first before attempting to solve an equation.

- Distribute
- Combine Like Terms—looking at each side of the equation separately
- The variable must be on only one side of the equation. If it is on both sides, choose a term with the variable and add its inverse to both sides.

Sample problems:

3(x + 7) = 30 2(x + 3) = 12 – x -(x + 7) – 5 = 4(x + 3) – 6x

Absolute Value Equations:

The two bars should remind you there are _____ answers. You need to set up _____ problems.

Isolate the bars _____. There CANNOT be anything outside of the bars before you set up your two equations. Take the _____ inside the bars and write it _____. Set one expression equal to the _____ answer and one equal to the _____ answer. Work each problem separately!

Sample problems: |4x – 5| = 3 2|3x + 1| = 20 |x – 6| -2 = - 7

Word problems:

1. Read the facts. (sentences)
2. Identify what are the unknowns—represent it or them with a variable(s). If there is more than one unknown, decide which variable is independent (the one you have control over—x) and dependent

(the one that is based on what you decide—the cost is based on how many videos you rent—you control videos; you don't control the cost)

3. Identify whether or not there is a constant—something that is not going to change; it is what it is regardless.
4. Identify the rate by which something (the unknown independent variable) is increasing or decreasing.

Y = _____ _____ _____ _____

ST OP RA IN

ST—starting place (the constant)

OP—is the amount increasing (+) or decreasing (-)?

RA—the rate ex. $0.55 per pound of grapes—rate increases $0.55 per pound of grapes

IN—independent variable—what you have control over—ex—how many pounds of grapes you buy.

Janice made $3400 last month as a real-estate person. Her base salary is $1000, and she received a 4% commission on her sales. What were her total sales for the month?

The basketball booster club spent $1750 to print 2500 basketball programs. They plan to sell each program for $2. How many programs must they sell to make a profit of $650?

Profit = Revenue – cost

Revenue—how you make money cost—money you had to spend

Evaluate each of the expressions if $x = 3$ $y = -2$ $z = -4$

$(5x – 2) – (3y + 1)$

$|-3y| + 7$

$4z^2 - |x + z|$

Check the following solutions students gave as their answers and determine whether they are correct or not. (Use the checking process—do not solve on your own to verify.)

If an answer is incorrect, go back and solve on your own to find the correct answer.

$n + 4n – 22 = 7n$ Sam got x = 11. Is he correct?

$y + 2(y-5) = 2y + 2$ Theresa got y = 12. Is she correct?

$-9x + 7 = 3x + 19$ Robin got x = -1. Is she correct?