

2B Solving Equations.doc

Prealgebra

Name: _____ Due Date: _____

WHY: Learning to solve different kinds of equations is at the heart of algebra. What is meant by the “solution to an equation”? How do we find solutions? Our goal in this activity is to answer these questions.

LEARNING OBJECTIVES:

- 1) Explain the concepts of expressions, equations, and variables by drawing a metaphor to language.
- 2) Know the order of operations and accurately use it to evaluate expressions.
- 3) State precisely what is meant by the “solution to an equation” and identify solutions.
- 4) Explain and apply the concept of balance to solving and checking equations.

WARM UP:

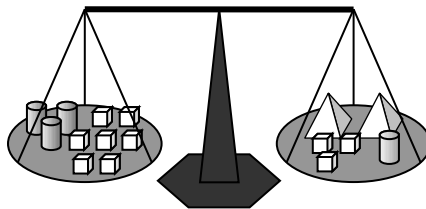
- 1) Explain “Please Excuse My Dear Aunt Sally.”

Evaluate the following:

- a) $2 + 3 \cdot 4$ b) $2 - 3 + 4$ c) $2(3 + 4)$ d) $24 \div 2 \cdot 3$
- e) $3 \cdot 4 \div 2$ f) $2 - (3 + 4)$ g) $2 \cdot 3^2$ h) -3^2

GROUP ACTIVITY:

- 1) What would happen to the balance if you removed one cylinder from the left hand side?
- 2) If I removed three cubes from the right hand side, what would you have to do to the left hand side in order to preserve the balance?
- 3) If I tripled the weights on the left hand side (three cubes for every one cube and three cylinders for every one cylinder), what would you have to do the right hand side to preserve balance?
- 4) How many cubes (☐) together with how many cylinders (🗄) weigh the same as one pyramid (🗯)? Explain how you determined your answer.
- 5) How is an equation like a balance?



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6) Are the following solutions to the given equations? Show work to justify your decision.

a) Is $x = 1$ a solution to $2x + 1 = 1$?

b) Is $y = 1$ a solution to $2y - 1 = y + 5 + y$?

c) Is $x = 2$ a solution to $7(x - 5) = 3 - 12x$?

d) Is $x = 0$ and $y = 1$ a solution to $y = x + 1$?

7) What is wrong with the following?

Q: Simplify $4(x - 3) + 8$

A: $4x - 12 + 8$
 $4x - 4 = 0$
 $4x = 4$
 $x = 1$

8) “Solve” means find the value of the variable that makes the equation a true statement. Solve the following equations for the indicated variable. Show complete, clear, and organized work. **Check your answers** by substitution.

a) Solve “ $9 + a = 12$ ” for a

b) Solve “ $4x = 3x + 9$ ” for x

c) Solve “ $17x + 30 = 64$ ” for x

d) Solve “ $7x = 35$ ” for x

e) Solve “ $y \div 23 = 14$ ” for y

f) Solve “ $4(x + 7) = 32$ ” for x

g) Solve “ $3n = 5(16 - n)$ ” for n

h) Solve “ $C = \frac{5}{9}(F - 32)$ ” for F

9) How would you solve $x^2 = 2^x$?