



## Concept: Solving Multi-Step Equations

Name:

- **You should have completed Equations Outline A for Topic 4: Solving Multi-Step Equations before beginning this handout.**

### Warm Up

Solve each multi-step equation below. *Show all your steps and make sure you check to see if your solution is correct.*

1.  $4(t - 2) - (t + 3) = t - 1$

2.  $5x + 5.4 = 2.9x - 0.9$



## COMPUTER COMPONENT

**Instructions:** Select the computer program *Understanding Equations* (Neufeld)  
Follow the instructions to the Main Menu.  
Select *Solving Multi-Step Equations* from the Main Menu.

**Notice:** You will need to use the **Jump To** feature of the program (found on the top left of your screen) in order to get to the section where you left off.



Work through all sections of the following topics **in order**:

- *Summary*
- *Literal Equations*
- *Practice Questions*



As you work through the computer exercises, make your notes in the **NOTES** section of this page.

When you reach the end of the section *Practice Questions* on the computer, move on to the **OFF COMPUTER EXERCISES** below.

### NOTES:

**Fill in the following:**

1. **Two ways to solve an equation.**

(a) \_\_\_\_\_

(b) \_\_\_\_\_

2. To keep a balance balanced, you must perform the \_\_\_\_\_

to \_\_\_\_\_.

3. You know when you have a solution when:

(a) \_\_\_\_\_

(b) \_\_\_\_\_



4. Combine like \_\_\_\_\_ if they are on the \_\_\_\_\_ side of the \_\_\_\_\_.

5. Equations with fractions, require you to first \_\_\_\_\_

(*three words*) by a \_\_\_\_\_ (*two words*).

This keeps the equation \_\_\_\_\_.

6. Use the \_\_\_\_\_ equation to check your answer by \_\_\_\_\_

your \_\_\_\_\_ for the \_\_\_\_\_ . Check each side

of the equation. Your solution is \_\_\_\_\_ if you have the same

\_\_\_\_\_.

### Literal Equations

7. Are the following perimeter equations the same? Why or why not.

$$P = 2L + 2W \quad \text{and} \quad L = \frac{P - 2w}{2}$$

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**Solving Linear Equations:** (You use similar steps to solve literal equations as you do for equations with one variable)

Solve  $4x + 2y = 16$  for  $y$

- The equation has \_\_\_\_\_ different variables, \_\_\_\_ and \_\_\_\_.
- Determine the variable you have to solve for: \_\_\_\_\_.
- You will need to isolate the variable to solve the literal equation.

Fill in the blanks.

Literal Equation	Similar Equation
$4x + 2y = 16$	$35 + 8y = 11$

- You will need to isolate the variable to solve the literal equation.

$4x$ _____ $+ 2y = 16$ _____		$35$ _____ $+ 8y = 11$ _____
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- Simplify

$2y = 16$ _____		$8y =$ _____
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- Isolate  $y$

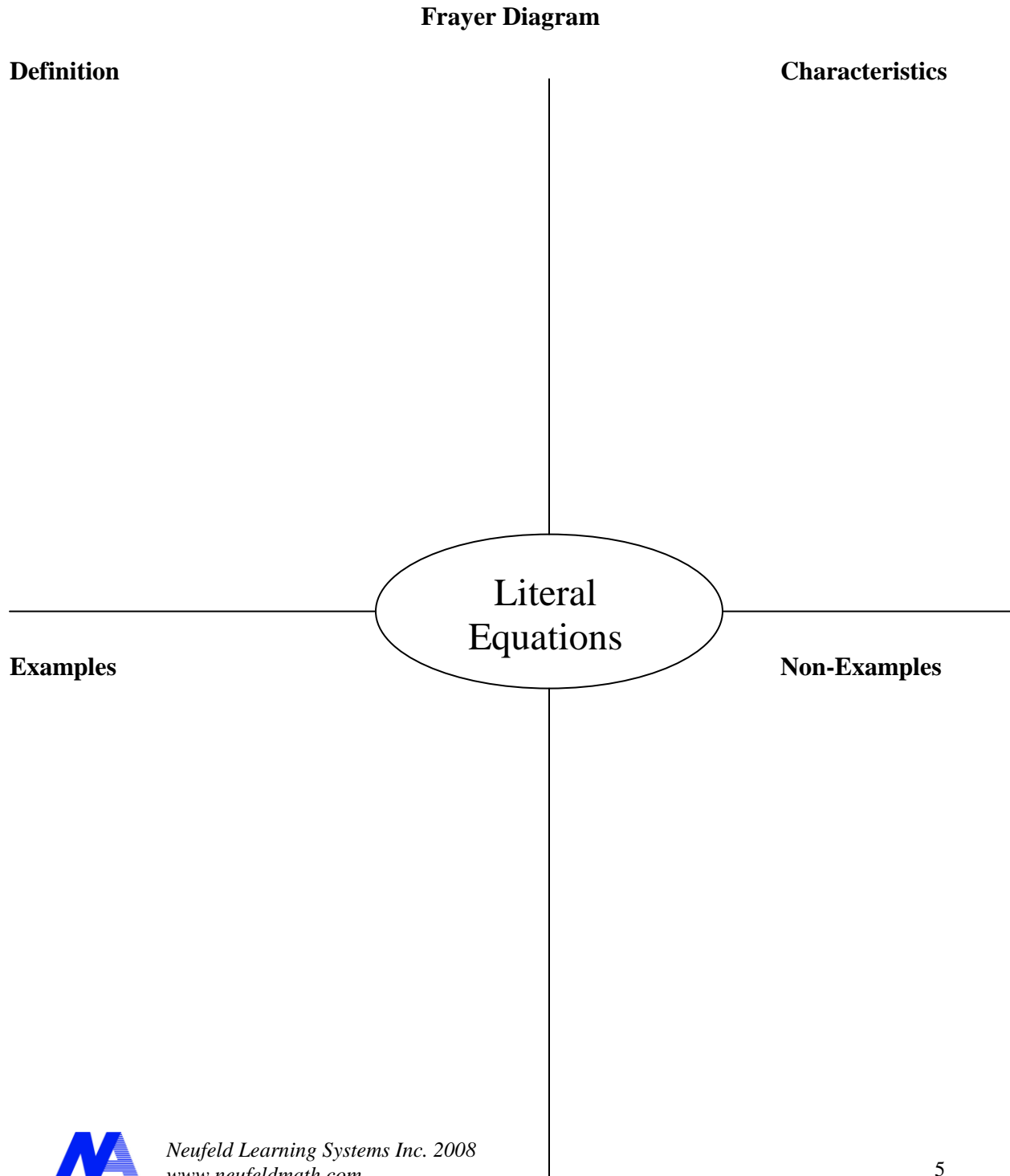
$\frac{2y}{2} = \frac{16}{2}$		$\frac{8y}{8} = \frac{\quad}{8}$
$= \frac{16}{2} - \frac{x}{2}$		

- Simplify

$y =$ _____		$y =$ _____
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**Literal Equations:**

Use the Frayer Diagram to demonstrate your understanding of the meaning of the word “Literal Equations”. First fill in examples and then the non- examples. Using these, determine the characteristics of “Literal Equations”. With the information in the chart, write your definition of “Literal Equations”.



**OFF COMPUTER EXERCISES**

1. Solve the following equations. (*Remember to show your work and check your answers.*)

(a)  $9 + 3(m - 4) = 5m + 1$

(b)  $3m - 4(m + 6) = 2(m + 2) - 13$

(c)  $3 - 2(x + 4) = -3(1 - 2x) + 14$

(d)  $6 + 3(m - 4) = 5m - 3$

(e) 
$$\frac{2n - 3}{2} = \frac{-n - 1}{4}$$

(f) 
$$\frac{3}{5} - \frac{x}{3} = \frac{x}{2}$$

(g)

$$\frac{3}{4} (2x - 1) = \frac{5}{6} (2 - 4x)$$

h)

$$\frac{6a - 5}{3} - 2 = \frac{5a - 1}{4} + \frac{1}{3}$$

2. Solve each literal question.

(a) Solve:  $y = mx + b$  for  $x$

(b) Solve:  $C = 2pr + w$  for  $p$

(c) Solve:  $P = 2L + 2W$  for  $L$  (*Hint: use a diagram.*)

- (d) As you know,  $P = 2L + 2W$  is the formula for perimeter. If a field has a width of 25m and a perimeter of 206 m, *find the length by using your answer in (c). (Hint: use a diagram.)*