

Warm-Up

8/22/17

①

Translate to algebraic expression.

a) Add 3 to 8 times z

b) Take away 6 from 2 times n

2. Simplify.  $8x - 3 + 4x - 3$

3. Simplify.  $7(x + 5)$

$$1a) \quad 8z + 3$$

$$1b) \quad 2n - 6$$

$$\begin{aligned} 2) \quad & 8x - 3 + 4x - 3 \\ & = 8x + 4x - 3 - 3 \\ & = \boxed{12x - 6} \end{aligned}$$

$$\begin{aligned} 3) \quad & 7(x + 5) \\ & = \boxed{7x + 35} \end{aligned}$$

# Module 2: Arithmetic to Algebra.

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## Essential Questions 8/22/17

1. How can I tell if a group of equations satisfies a number property?
2. What does it mean to evaluate expressions?

## Combining Like Terms 8/22/17

To combine like terms, add or subtract the coefficients and keep the variables and exponents the same.

If the coefficient is missing, it is always a positive or negative one. Coefficients take the sign in front of them.

Example:

$$-2x + 3 - 4x + 5 - 4x^2 + 11 - 15x + 2x^2 - 15$$

$$-4x^2 + 2x^2 = -2x^2$$

$$-2x - 4x - 15x = -21x$$

$$3 + 5 + 11 - 15$$

$$8 \quad 19 - 15 = 4$$

$$= -2x^2 - 21x + 4$$

# Class Work

# 8/22/17

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Day 2 – Algebraic Expressions Practice

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1. Complete the table.

Expression	List the Terms	List the Factors	List the Variables	List the Coefficients	List the Constants
$3y^3 + 4y^2 - 7y + 1$	$3y^3, 4y^2, -7y, 1$	$3, y, 4, -7, 1$	$y$	$3, 4, -7$	$1$
$5x^4 - 9x^2$	$5x^4, -9x^2$	$5, x, -9$	$x$	$5, -9$	none
$-a^2 + 6a - 3$	$-a^2, 6a, -3$	$-1, a, -3$	$a$	$-1, 6$	$-3$
15	15	$1, 3, 5, 15$	none	none	15

2. Write an expression with exactly 5 terms, containing the coefficients 7, 21, 15, and 8. (Answers will vary.)

Write the term with highest exponent first

3. Simplify each expression (hint: combine "like terms").

a.  $5f + 8 - 13f$

$$\begin{aligned} & -8f + 8 \\ & -8(f-1) \end{aligned}$$

b.  $2x - 5x^2 + 3 + 4x$

$$-5x^2 + 6x + 3$$

c.  $3x^2 + 6x - 2y + 4x^2 + 3y - x$

$$7x^2 + 5x + y$$

d.  $3(2x - 4) + 2x$

$$\begin{aligned} & 6x - 12 + 2x \\ & 8x - 12 \end{aligned}$$

e.  $-2(8y - 4) + 9y + 6$

$$\begin{aligned} & -16y + 8 + 9y + 6 \\ & -7y + 14 \end{aligned}$$

f.  $\frac{13 + 2(7x - 3)}{7} = \frac{13 + 14x - 6}{7}$

$$\begin{aligned} & = \frac{14x + 7}{7} = \frac{14x}{7} + \frac{7}{7} \\ & = 2x + 1 \end{aligned}$$

4. Give an example of two like terms and two unlike terms. Explain why they would or would not be classified as like terms.

Like

$$2x, 5x$$

Unlike

$$4y, 7x$$

5. Describe the error in evaluating the expression when  $m = 8$ .

**X**

$$\begin{aligned} 5m + 3 &= 5 \cdot 8 + 3 \\ &= 5 \cdot 11 \\ &= 55 \end{aligned}$$

✓ **Pemdas Rule!**  
You should multiply 5 by 8, then add 3

$$5 \cdot 8 + 3$$

$$40 + 3$$

$$= 43$$



Foundations of Algebra

Module 2: Arithmetic to Algebra

CW Practice

6. Evaluate the following expressions when  $a = 10$ ,  $b = 9$ , and  $c = 4$ .

a.  $a^2 - 18$

$$\begin{aligned} (10)^2 - 18 \\ 100 - 18 = \boxed{82} \end{aligned}$$

b.  $bc + 12.3$

$$\begin{aligned} 9 \times 4 + 12.3 \\ 36 + 12.3 \\ = \boxed{48.3} \end{aligned}$$

c.  $3a + 2b - 6c$

$$\begin{aligned} 3(10) + 2(9) - 6(4) \\ 30 + 18 - 24 \\ 48 - 24 \\ = \boxed{24} \end{aligned}$$

7. The expression  $20a + 13c$  is the cost for  $a$  adults and  $c$  students to enter the science museum.

a. Find the total cost for 4 adults and 24 students.

$$\begin{aligned} 20(4) + 13(24) \\ 80 + 312 = \boxed{392} \end{aligned}$$

$$\begin{array}{r} 13 \\ 24 \\ \hline 52 \\ 26 \\ \hline 312 \\ + 80 \\ \hline 392 \end{array}$$

b. You figure out the cost for the group, but then the number of adults and students in the group both double. Does the cost double? Explain your answer using an example.

$$\begin{aligned} 20(8) + 13(48) \\ 160 + 624 \\ = \boxed{784} \end{aligned}$$

$$\begin{array}{r} 392 \\ \times 2 \\ \hline 784 \end{array}$$

$$\begin{array}{r} 13 \\ 48 \\ \hline 104 \\ 52 \\ \hline 624 \\ + 160 \\ \hline 784 \end{array}$$

Yes the total cost doubled when the # of both adults and students doubled.

c. In part A, the number of adults doubles, but the number of students is cut in half. Does the cost remain the same? Explain why or why not.

$$20(\overset{8}{8}) + 13(\overset{12}{12})$$

$$160 + 156$$

$$= \boxed{316}$$

The cost does not remain the same since the # of adults doubled and the # of students is cut in half.

8. Stretch your thinking - Simplify the following expression:  $5(x - 4) - (2x - 7) + x - 2(x + 3)$

$$5x - 20 - 2x + 7 + x - 2x - 6$$

$$5x - 2x + x - 2x - 20 + 7 - 6$$

$$2x - 19$$

