Lesson 1.0: Gr. 9 Polynomials Review

Specific Outcome: Simplify polynomials. 4.5 – Multiply two polynomials symbolically, and combine like terms in the product. 4.6 – Generalize and explain a strategy for multiplication of polynomials.

Variable:

Term:

Polynomials:

- **Monomial:**

- **Binomial:**

- **Trinomial:**

Like Terms:

SIMPLIFYING POLYNOMIALS: Gr. 9 REVIEW

Exponent

Coefficient $\longrightarrow$ $4x^3$ $\longleftarrow$ Variable (or Base)

Practice: Identify the coefficients, variables, exponents and give an example of a like term.

	Coefficients	Variables	Exponents	Like Term
$8c^2$				
$-y^8$				
$-3r^5st^7$				

Remember: Distributive Property: $a(b + c) = ab + ac$

* $-(b + c) = -b - c$

*When simplifying using addition and subtraction, you combine **like terms** by only adding or subtracting the *coefficients*.

Practice: Simplify the following expressions by using the distributive property (if needed) and collecting like terms.

1) $7x + 5 - 3x$	2) $6w^2 - 11w + 8w^2 - 15w$	3) $(12x - 5) - (7x - 11)$
4) $(2x^2 - 3x + 7) - (-3x^2 + 4x - 7)$	5) $4x^2 - 9x + 6 - (2x^2 - 3x - 1)$	6) $(3x^2 + 4x) + (-5x^2 - x + 17)$

Problem Solving:

1. When $4x^2 + 3x - 4$ is subtracted from $7x^2 - 8x + 9,$ the answer can be written in the form $ax^2 - bx + c.$ The value of $a + b + c$ is _____.

13. Simplify

a) $6p - 7q - 3q - 2p$ b) $5x - 3x^2 + 2x - 8x^2$ c) $\frac{1}{2}x - 3 + \frac{3}{2}x + 18$

d) $4a^3 + 7a - 2a^2 - 6a - 4a^3 - a^2$ e) $3 - 2x + 7y + 4y - 2x + 8z - 9$

14. Simplify the following polynomial expressions by collecting like terms.

a) $(5a - 9b - 2c) + (c - 7b - 3a)$ b) $(3 - a - 2a^2) + (9 - 4a + 5a^2)$

c) $(2x^2 + 5x - 1) + (3x - 6 - 6x^2) + (4 - 5x + x^2)$ d) $(4a - 6b) - (5a - 2b)$

15. a) Subtract $3x^2 - 2x + 7$ from $6x^2 - 5x - 2$.

16. A triangle has a perimeter of $(6m + n)$ cm. One side measures $(2m - 3n)$ cm and another side measures $(3n + 2m)$ cm.

a) Write and simplify an expression for the length of the third side of the triangle.

b) Determine the measure of each side when $m = 4$ and $n = -1$.

shaded is positive
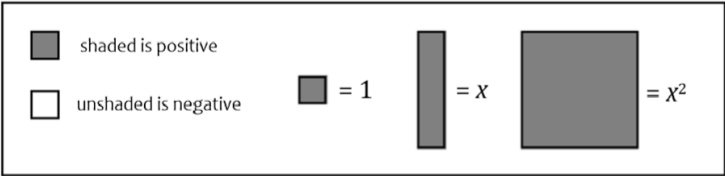
unshaded is negative

$\square = 1$ $= x$ $= x^2$

Use algebra tiles to expand: 2(x + 1)   *Solution:* We can think of the **factors** of **(x+1)** and **2** as the **length** and **width** of a rectangle, and then fill the rectangle in by **multiplying each part of the factors** together as follows:

2

x + 1

Solution: **2(x + 1)** =
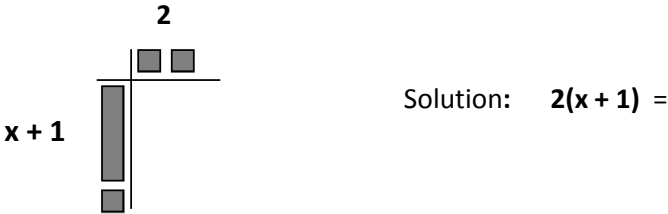
Practice: Write the *factors* that the algebra tiles show, and complete the diagram to determine the *product.* Write the equation showing the *factors and their product.*

1.

2.

MORE SIMPLIFYING POLYNOMIALS

Simplify: **3(2x – 5) + 5(3x + 6) – (x – 8)**

Practice: Simplify the following expressions.

1. 4(7x - 8) + 6(5x + 10)	2. $6(4x^2 - 5x + 2) + 3(-8x^2 + 11x + 4)$
3. $5(4x^2 - 8x + 3) - 7(6x^2 - 4x + 11)$	4. $4(6x^3 - 4x^2 + 7x + 1) - 9(4x^3 - 2x^2 - 6x + 1)$
5. $10(4x^2 + 8x + 7) - 8(5x^2 + 10x -9)$	6. $3(12x^4 - 16x^3 + 4x^2 - 8x + 24) - 4(9x^4 - 12x^3 -3x^2 -6x + 18)$

Problem Solving:

1.

Which of the following expansions is incorrect?

A. $-2x^2(3x + 2) = -6x^3 - 4x^2$
B. $-4x(2 - x) = -8x + 4x^2$
C. $-5x(x^2 - 3) = -5x^3 - 15x$
D. $7x^2(x^2 + 3) = 7x^4 + 21x^2$

2. The expression $2x(4 - 3x) + 5x(2x - 1) - 3(4x + 2)$ can be written in the form $ax^2 - b - c$. The value of $a + b + c$ is

_____.