

lesson thirty four - student resource sheet

Lesson Objective: Simplify polynomials using addition and subtraction.

Vocabulary Box

coefficient – A constant that multiplies a variable. Example: the 4 in $4x$.

polynomial – An algebraic expression consisting of two or more rational and integral terms.
Example: $x^3 + 4x^2 - 7x + 1$.



Independent Practice

Complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

Directions: Add or subtract as indicated.

1. $(4x^2 + 5x + 9) + (x^2 - x - 9)$

2. $(3y^2 - 4y - 13) - (5y^2 + 7y - 8)$

3. $(5z^4 - 2z^2 + z - 7) + (-2z^4 - 3z^3 + z - 5)$

4. $(7a^3 - 5a^2 - 8) - (2a^2 - 5a + 8)$

5. $(16 - c^4 - 9c^2) + (c^3 - 6c^2 + 6c - 27)$

6. $(-d^3 - 8d + 2d^2 + 16) - (9d^3 - 6d^2 + d)$

7. $(f^5 + 7f^4 - 5f^3) + (8f - 4f^2 - f^3)$

8. $(-30 - 13h + h^2) - (-42 - 13h + h^2)$



Directions: Add or subtract as indicated.

1. $(7k^2 - 4k - 5) - [(k^2 - 2k - 3) - (-4k^2 + 2k - 7)]$

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2. $8m^3 - [4m^3 - m^2 - [-m^3 - 3m^2 - m - (7m^3 - 6m^2 + m - 15)]]$

Problem **Solving**

I. Frankie created the following pattern: $2, 3x, 4x^2, 5x^3, \dots$. Answer the following questions based on Frankie's pattern.

1. What are the next 3 terms in Frankie's pattern?

2. Frankie evaluated each of the terms in her pattern for $x = 2$. What is the value of each of the 7 terms if $x = 2$?

3. Frankie then evaluated each of the terms in her pattern for $x = \frac{1}{2}$. What is the value of each of the 7 terms if $x = \frac{1}{2}$?

4. Write about any additional patterns you may have observed.

II. Parker created the following pattern: $1, x + 2, x^2 + 2x + 3, x^3 + 2x^2 + 3x + 4, \dots$. Answer the following questions based on Parker's pattern.

1. What are the next 2 terms in Parker's pattern?
2. Parker evaluated each of the terms in her pattern for $x = 1$. What is the value of each of the 6 terms if $x = 1$?
3. Parker then evaluated each of the terms in her pattern for $x = -1$. What is the value of each of the 6 terms if $x = -1$?
4. Write about any additional patterns you may have observed.

III. Mr. Lee created the following pattern: $2^x, 2 + 2^{x+1}, 2 + 2 + 2^{x+2}, \dots$. Answer the following questions based on Mr. Lee's pattern.

1. What are the next 2 terms in Mr. Lee's pattern?
2. Mr. Lee evaluated each of the terms in his pattern for $x = 1$. What is the value of each of the 5 terms if $x = 1$?

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3. Mr. Lee then evaluated each of the terms in his pattern for $x = 2$. What is the value of each of the 5 terms if $x = 2$?
4. Write about any additional patterns you may have observed.



Directions: Add or subtract as indicated.

1. $(4x^2 + 7x + 9) + (x^2 - 12x - 4)$
2. $(9 - 5v - v^2 - 3v^3) + (v^4 - 12v^2 + 36)$
3. $(5r^3 + 7r^2 + 10r - 5) - (8r^3 + 7r^2 - 4r + 12)$

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Lesson Objective: Multiply polynomials using the distributive property and the FOIL method.

Vocabulary Box

monomial – An algebraic expression consisting of one term. Example: $4m$.

binomial – An algebraic expression consisting of two terms. Example: $3n + 6$.

trinomial – An algebraic expression consisting of three terms. Example: $7p^2 - p + 2$.



Guided Practice

You will complete the following practice problems with your partner. Then your teacher will review the answers. Make sure that you show all important work.

Directions: Simplify each expression.

1. $k^2(16 + 6k - k^2)$

2. $(5w^2 - w - 7)(-4w)$

3. $(j + 5)(j + 10)$

4. $(2q + 9)(q - 1)$

5. $(b - 7)(b - 7)$



Summary/Closure

A. Vocabulary Words

Directions: Match each name of a type of algebraic expression with the number of terms it has.

- | | |
|---------------|------------------|
| 1. binomial | A. zero |
| 2. monomial | B. one |
| 3. polynomial | C. exactly two |
| 4. trinomial | D. exactly three |
| | E. many |

B. Summarize What We Learned Today

Directions: Write and simplify two problems requiring multiplication of a monomial by a trinomial. Next, write three problems requiring multiplication of two binomials. Be sure to include a variety of signs. Then, write a few sentences to explain how to multiply these polynomials. You will use this explanation as a personal reminder.

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Lesson Objective: Multiply polynomials using the distributive property and the FOIL method.

Vocabulary Box

monomial – An algebraic expression consisting of one term. Example: $4m$.

binomial – An algebraic expression consisting of two terms. Example: $3n + 6$.

trinomial – An algebraic expression consisting of three terms. Example: $7p^2 - p + 2$.



Independent Practice


Complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

Directions: Simplify each expression.

1. $(m + 9)(m - 8)$

2. $(7n + 1)(n + 5)$

3. $-8(5b^2 - b + 8)$



4. $(v - 3)(v - 17)$


5. $(c + 3)(c - 10)$

6. $4x(9x^2 + 4x + 1)$

7. $(7z - 8)(8z + 11)$

8. $(2k + 3)(2k - 3)$

9. $(h^2 - 5h + 9)(-3h)$



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Directions: Simplify each expression.

1. $(m + 4)^2$

2. $(a + 7)(a^2 + 5a + 4)$

3. $(f + g)(h + j)$

4. $(3x + 4y)(5x - 2y)$

Problem Solving



Look at the table below. Your job will be to work with other class members to find a match for each entry in the table. Each binomial will match with a trinomial for which it is a factor. For example, $(x + 5)$ would match with $x^2 + 7x + 10$ because $(x + 5)(x + 2) = x^2 + 7x + 10$; that is, $x + 5$ is a factor of $x^2 + 7x + 10$.

List all of the matching pairs below the table. Then, individually, find the missing binomial factor. In the example above, the missing binomial factor would have been $(x + 2)$.

Some binomials might be factors of more than one trinomial, but you must create six distinct matches. Therefore, you might have to do some switching around.

$x + 9$	$x^2 - 7x + 12$	$x - 3$
$x + 4$	$x^2 + 16x + 63$	$x^2 + 9x + 14$
$x^2 - 10x + 25$	$x^2 + x - 12$	$x + 5$
$x + 2$	$x - 10$	$x^2 - 8x - 20$

Good luck!

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Directions: Simplify each expression.

1. $(x - 9)(2x + 5)$

2. $-6y(y^2 + 6y - 9)$

3. $(4z - 7)(3z - 2)$

