

ALGEBRA I

Unit 7

The collage features several overlapping worksheet pages:

- Polynomial Worksheet:** Includes sections for "Main Ideas/Questions", "Notes/Examples", "POLYNOMIAL", "STANDARD FORM", and "EXAMPLES". Examples include $3x+1+2x^2$ and w^3+5w^2+28-w .
- Multiplying Binomials Worksheet:** Features a "WARM-UP" section with the title "Multiplying Binomials" and instructions: "To multiply binomials, distribute in the first binomial to each other binomial, then combine. This order of distributing is referred to as the 'FOIL' method." Example 1: $(x+2)(x+4)$.
- What is Factoring? Worksheet:** Contains a "WARM-UP" section with the question "WHAT IS FACTORING?" and a "FACTORING" section explaining that polynomials that cannot be factored are called "prime" and that there are several factoring methods, starting with the greatest common factor (GCF).
- Factoring Trinomials Worksheet:** Includes a "WARM-UP" section with directions to simplify polynomials like $(x+1)(x+5)$, $(m-4)(m+6)$, and $(k-7)(k-3)$. It also has a "FACTORIZING TRINOMIALS of the form x^2+bx+c " section with a "Guided Example" and "SET I" directions to factor $m^2+9m+20$.
- Mixed Factoring Worksheet:** Features a "WARM-UP" section with directions to simplify $(x+4)(x-4)$, $(5m+1)(5m-1)$, and $(2a+3b)(2a-3b)$. It also includes "Steps to Factor a DIFFERENCE OF SQUARES" and "EXAMPLES" like a^2-4 and $81-x^2$.
- Mixed Factoring Worksheet:** Includes a "WARM-UP" section with the title "Mixed Factoring" and instructions: "Up until now, factoring has been a bit organized! We are ready to mix it up! Follow the guide below to help you through the factoring process." It lists "Step 1: Check for a GCF!" and "Step 2: Check for one of the following patterns and factor if possible:" including "Difference of Squares (a^2-b^2)" and "Basic Trinomial (x^2+bx+c)".

POLYNOMIALS & FACTORING

NOTES • HOMEWORK • QUIZZES • TEST

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Unit 7 - Polynomials & Factoring: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Intro to Polynomials: Classify, Add, Subtract	HW #1
DAY 2	Multiplying a Monomial and a Polynomial	HW #2
DAY 3	Multiplying Binomials and Trinomials	HW #3
DAY 4	Dividing Polynomials by a Monomial	HW #4
DAY 5	Quiz 7-1	None
DAY 6	Factoring Polynomials: Greatest Common Factor	HW #5
DAY 7	Factoring Polynomials: Difference of Squares	HW #6
DAY 8	Factoring Polynomials: Trinomials ($x^2 + bx + c$)	HW #7
DAY 9	Factoring Review	Study
DAY 10	Quiz 7-2	None
DAY 11	Factoring Polynomials: Trinomials ($ax^2 + bx + c$)	HW #8
DAY 12	Factoring Polynomials: Grouping	HW #9
DAY 13	Review All Types of Factoring; Factoring Brochure	HW #10
DAY 14	Mixed Factoring	HW #11
DAY 15	Quiz 7-3	None
DAY 16	Dividing Polynomials by a Binomial	HW #12
DAY 17	Unit 7 Review	HW #13
DAY 18	UNIT TEST	None

See sample images of the pages on the next page.

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
POLYNOMIAL	
STANDARD FORM	
EXAMPLES	Directions: Write each polynomial. 1. $3x+1+2x^2$

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
Multiplying Binomials	To multiply binomials, distribute each term in the first binomial to each term in the other binomial, then combine like terms. This order of distributing is frequently referred to as the "FOIL" method. $(a+b)(c+d) = ac + ad + bc + bd$ Example 2: $(2x+1)(x+3)$

Name: _____ Algebra I
 Date: _____ Bell: _____ Unit 7: Polynomials

Quiz 7-1: Classifying & Simplifying Polynomials
 Classify the following polynomials by degree and number of terms.

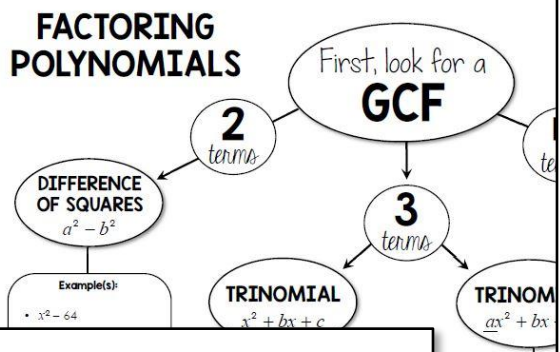
- $4p^3 + 2p^2 + 19p - 5$
- $5x^4 + 12$
- $n^2 - 7n - 21$
- 3
- $2x + 7$
- $-3y^2$

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
WARM-UP	Directions: Simplify the following polynomials. • $a(3a+7)$

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
WARM-UP	Directions: Simplify the following polynomials. • $(x+4)(x-4) =$ _____ • $(5m+1)(5m-1) =$ _____ • $(2a+3b)(2a-3b) =$ _____ This resulting product is a DIFFERENCE OF SQUARES .
Steps to Factor a DIFFERENCE OF SQUARES	<ol style="list-style-type: none"> First, make sure you have an actual difference of squares. (Must be a subtraction sign and you can't have a common factor.) Use the following rule to factor: $a^2 - b^2 = (a+b)(a-b)$ Check your work by distributing!



Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
WARM-UP	Directions: Simplify the following polynomials. • $(x+1)(x+5) =$ _____ = _____ • $(m-4)(m+6) =$ _____ = _____ • $(k-7)(k-3) =$ _____ = _____
FACTORIZING TRINOMIALS of the form $x^2 + bx + c$	To factor a trinomial of the form $x^2 + bx + c$, you must find two integers that _____ and _____. Guided Example: $x^2 + 7x + 12$ What two integers have a product of 12 and a sum of 7? _____ Write two binomials using these integers, then distribute to check.

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
WARM-UP	Directions: Simplify the following polynomials. • $(x+1)(x+5) =$ _____ = _____ • $(m-4)(m+6) =$ _____ = _____ • $(k-7)(k-3) =$ _____ = _____
FACTORIZING TRINOMIALS of the form $x^2 + bx + c$	To factor a trinomial of the form $x^2 + bx + c$, you must find two integers that _____ and _____. Guided Example: $x^2 + 7x + 12$ What two integers have a product of 12 and a sum of 7? _____ Write two binomials using these integers, then distribute to check.

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
FACTORIZING POLYNOMIALS with FOUR TERMS	It is possible to factor a polynomial with four terms called grouping. Follow the steps below. Step 1: Group the first two terms together and the last two terms together. Step 2: Factor out the GCF from each binomial. Step 3: Factor the common binomial. Step 4: Distribute to check your answer. Directions: Factor each polynomial completely. 1. $x^3 + 4x^2 + 8x + 32$ 3. $w^3 + 5w^2 - 8w - 40$ 5. $p^3 - 6p^2 - 2p^2 + 12$
MORE EXAMPLES	

Name: _____ Date: _____
 Topic: _____ Class: _____

Main Ideas/Questions	Notes/Examples
Mixed Factoring	Up until now, factoring has been a bit organized. Follow the guide below to help you through the process. Step 1: Check for a GCF. Step 2: Check for one of the following patterns: • Difference of Squares ($a^2 - b^2$) • "Basic" Trinomial ($x^2 + bx + c$) • "Slip and Slide" Trinomial ($ax^2 + bx + c$) • Four Terms (use grouping) Step 3: Check to see if something factors AGAIN! Directions: Factor each polynomial completely. 1. $28a^2b - 63b$ 3. $x^3 + 2x^2y - 4x - 8y$ 5. $45w^5 - 3w$ 7. $8x^4 - 4x^3 - 24x^2$ 9. $x^3 + 3x^2 - 5x - 15$ 2. $3m^2 + 6m - 9$ 4. $4y^2 + 7y - 2$ 6. $24x^2y^2 - 3y$ 8. $64x^2 - 16x + 1$ 10. $h^2 - 6h + 9$
Examples	

Name: _____ Date: _____ Per: _____

Unit 7 Test Study Guide (Polynomials & Factoring)

Topic 1: Writing Polynomials in Standard Form
 Directions: Write each polynomial in standard form.
 1. $a^2 + 3a^2 - 7a + 2a^2 - 4$
 2. $8y^3 - 3y^2 - x^2y + 2x^3$

Topic 2: Classifying Polynomials
 Directions: Classify each polynomial by degree and number of terms.
 3. $3x + 12$
 4. 24
 5. $-7x^2 + 4x + 1$
 6. $3x^4 - x^3 + 5x^2 + x - 7$

Topic 3: Simplifying Polynomials
 Directions: Simplify each polynomial. Write all answers in standard form.
 7. $(2x^2 + 3x + 2) - (x^2 - 4x - 1)$
 8. $2a^2(5a^2 - 7a) + (3a^4 - a^3)$
 9. $5c^2d(9c^2d^2 - 4c^2d - 2)$
 10. $-4y(5y - 11) - 2y(3y + 10)$
 11. $(x - 1)(4x - 3)$
 12. $(5y - 1)^2$
 13. $(2x + 5y)(x - 3y)$
 14. $(x + 4)(4x - 2) - 2x^2$
 15. $\frac{-8x^3 + 28x^2 - 4x^3}{4x^2}$
 16. $\frac{27c^2d^3 - 15c^2d^3}{3c^2d^2}$

Name: _____ Algebra I Unit 7 Test
 Date: _____ Bell: _____ (Polynomials & Factoring)

SHOW ALL WORK NEEDED TO ANSWER EACH QUESTION!
PLACE YOUR FINAL ANSWER IN THE BOX. GOOD LUCK!

1. Given the polynomial below, which shows the terms in standard form? $5m^2n + 9m^3 - mn^2 + 2m^3$	2. Classify the following expression below. $3x^4$
A. $2m^3 + 9m^3 + 5m^2n - mn^2$ B. $9m^3 + 5m^2n + 2m^3 - mn^2$ C. $2m^3 + 5m^2n - mn^2 + 9m^3$ D. $9m^3 - mn^2 + 5m^2n + 2m^3$	A. Constant Monomial B. Linear Monomial C. Cubic Monomial D. Quartic Monomial
3. Classify the expression below. $2x^4 - x + 5$	4. Simplify the expression below. $(2x^2 - 5x + 6) + (5x^2 - 3x + 4)$
A. Linear Trinomial B. Cubic Trinomial C. Quadratic Trinomial D. Quartic Trinomial	A. $7x^2 - 8x + 10$ B. $7x^2 - 2x + 10$ C. $7x^2 - 8x + 2$ D. $7x^2 - 2x + 2$
5. Simplify the expression below. $(7y^2 - 3y) - (4y^2 + 2y - 2)$	6. Simplify the expression below. $3xy(5x^2 + 2xy + 3y^2)$
A. $3y^2 - 5y - 2$ B. $3y^2 - 5y + 2$ C. $3y^2 - y - 2$ D. $3y^2 - y + 2$	A. $15x^3y + 6x^2y^2 + 9xy^3$ B. $15x^3y + 2xy + 3y^3$ C. $15x^3y + 6x^2y^2 + 9xy^2$ D. $15x^3 + 5xy + 3y^2$