



Algebra 1 Workbook

Polynomials

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MATH

ADDING AND SUBTRACTING POLYNOMIALS

■ 1. Which part(s) of the terms stay the same when we add or subtract like terms?

■ 2. Simplify the expression.

$$(2x^3 - 5x^2 + x - 3) - (x^2 - 2x + 7)$$

■ 3. What went wrong in this set of steps?

$$6x^3 + 7 + x^2$$

$$7x^3 + 7$$

■ 4. Simplify the expression.

$$(10a^2b + 3ab^2 - ab) + (2ab^2 - a^2b + ab)$$

■ 5. Simplify the expression.

$$(x^4 - 5y^3 + z - xy) - (2y^4 + 6xy - z + x^4)$$



■ 6. What went wrong in this set of steps?

$$9 - x^3 + 3 + 4x^3$$

$$12 + 3x^6$$



MULTIPLYING POLYNOMIALS

- 1. Use the Distributive Property to expand the expression.

$$\frac{1}{2}(6x + 4)(x - 1)$$

- 2. What should we put in place of the “??” to make the expression true?

$$(2x + 1)(5 - x) = ?? + 10x - x + 5$$

- 3. What went wrong in this set of steps?

$$(a - 2)^2$$

$$a^2 - 4$$

- 4. Use the Distributive Property to expand the expression.

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

- 5. Fill in the blank.

$$(3 - a)(5 + a) = 15 + \underline{\hspace{1cm}} - a^2$$



■ 6. Expand the expression.

$$(x^2 - 3)(2 - x)$$



DIVIDING POLYNOMIALS

- 1. Simplify the expression using polynomial long division.

$$(3x^3 - x^2 + 5) \div (x + 2)$$

- 2. What went wrong in setting up the long division problem?

$$(5x^4 - 3x^2 + x - 2) \div (x^2 + 1)$$

$$5x^4 - 3x^2 + x - 2 \overline{) x^2 + 1}$$

- 3. Express the full solution of the polynomial long division.

$$\begin{array}{r} 3x - 1 \\ x^2 - 3 \overline{) 3x^3 - x^2 + x - 5} \\ \underline{-(3x^3 + 0x^2 - 9x)} \\ -x^2 + 10x - 5 \\ \underline{-(-x^2 + 0x + 3)} \\ 10x - 8 \end{array}$$



- 4. Simplify the expression using polynomial long division.

$$(2x^5 - 3x^3 + x^2 + 4x - 1) \div (x^2 + 2)$$

- 5. Simplify the expression using polynomial long division.

$$\frac{x^5 - x^3 + 4x^2 - x + 6}{2x^3 - 5}$$

- 6. Simplify the expression using polynomial long division.

$$(3x^2 + 2x + 5) \div (3x + 5)$$



MULTIPLYING MULTIVARIABLE POLYNOMIALS

- 1. Simplify the expression.

$$(a - 3y)(2a + y)$$

- 2. Simplify the expression.

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

- 3. Fill in the blanks with the correct terms.

$$(5a - b)(7b - 3a)$$

$$35ab - 15a^2 + \underline{\hspace{1cm}} + 3ab$$

$$\underline{\hspace{1cm}} - 15a^2 + \underline{\hspace{1cm}}$$

- 4. What went wrong in this set of steps?

$$(a^2 + 6b)(-a - b^2)$$

$$-a^3 - a^2b^2 - 6ab - b^3$$

$$-a^3 - 7ab - b^3$$



■ 5. Fill in the the multiplication chart with the correct terms, given the following product of binomials.

$(4a + 3b)(-a + 2b^2)$

		3b
-a		-3ab

■ 6. Simplify the expression.

$(5ax - 3by)(a + y) - (a - y)(2ax + 4by)$



DIVIDING MULTIVARIABLE POLYNOMIALS

- 1. Find the quotient.

$$\frac{3x^2 + 6xy - 2y^2}{x - 2y}$$

- 2. Identify the quotient, remainder, and divisor.

$$\begin{array}{r}
 x^2 - xy + y^2 \\
 x + y \overline{) x^3 + 0x^2y + 0xy^2 + y^3} \\
 \underline{-(x^3 + x^2y)} \\
 -x^2y + 0xy^2 \\
 \underline{-(-x^2y - xy^2)} \\
 xy^2 + y^3 \\
 \underline{-(xy^2 + y^3)} \\
 0
 \end{array}$$

- 3. How should we rewrite the expression before starting the long division?

$$\frac{2y^3 - xy^2 + x^3}{x - y}$$



- 4. Find the quotient.

$$\frac{6x^2 - xy + 2y^2}{2x - y}$$

- 5. In words, what's the first question we should ask when solving this long division problem?

$$2x + 3y \overline{) 6x^4 - x^2y + xy^2 + 4y^4}$$

- 6. Find the quotient.

$$(y^2 + xy - 3x^2) \div (y + x)$$



