Algebra 1 Workbook

Polynomials

krista king MATH

ADDING AND SUBTRACTING POLYNOMIALS

1. What stays the same when adding and subtracting like terms?

2. Simplify the expression.

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

3. What went wrong in the following set of steps?

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

$$7x^3 + 7$$

4. What is the coefficient in the following expression?

$$5x^8$$

5. Simplify the expression.

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

6. What is the exponent in the following expression?

$3z^8$

7. Simplify the expression.

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

8. What is the variable in the following expression?

$$-y^4$$

9. What went wrong in the following set of steps?

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

$$12 + 3x^6$$

MULTIPLYING POLYNOMIALS

1. Expand the expression.

$$(2x - y)^2$$

2. What does FOIL stand for?

3. What went wrong in the following set of steps?

$$(a - 2)^2$$

$$a^2 - 4$$

4. Expand the expression.

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

5. Fill in the blank.

$$(3 - a)(5 + a) = 15 + \_\_\_ - a^2$$

6. Expand the expression.

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

7. What went wrong in the following set of steps?

$(x - y)(x + y)$

$x^2 - 2xy - y^2$

DIVIDING POLYNOMIALS

1. In words, what is the first question you should ask when solving the problem using long division?

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

2. Simplify the expression using polynomial long division.

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

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

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

$5x^4 - 3x^2 + x - 2 \;|\; x^2 + 1$

4. Given the following long division, write the answer as

$$\text{quotient} + \frac{\text{remainder}}{\text{divisor}}$$

$$
\begin{array}{r}
3x-1 \\
\hline
x^2-3 \;\big|\; 3x^3-x^2+x-5 \\
-3x^3 \quad +9x \\
\hline
-x^2+10x-5 \\
x^2 \quad\quad -3 \\
\hline
10x-8
\end{array}
$$

5. Use long division to simplify the expression.

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

6. How would you rewrite the expression before starting the long division process?

$$(6x^3 - x + 7) \div (x + 1)$$

7. Set up but do not solve the following division problem.

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

8. Simplify the expression using polynomial long division.

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

MULTIPLYING MULTIVARIABLE POLYNOMIALS

1. Why can we not add the following two terms?

$$2x^3y + x^3y^2$$

2. Simplify the expression.

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

3. What went wrong in the following set of steps?

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

$$-2x^2 - bx - 6bx + 3b^3$$

4. Simplify the expression.

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

5. Fill in the blanks with the correct terms.

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

$$35ab - 15a^2 + \_\_\_ + 3ab$$

$$\_\_\_ - 15a^2 + \_\_\_$$

6. What does FOIL stand for when used in multiplying multivariable polynomials?

7. Fill in the following chart for the multiplication of the following two expressions.

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

	2x	-3y
x^2		
y		

8. What went wrong in the following set of steps?

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

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

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

9. Fill in the blanks of the multiplication chart with the correct terms when given the following problem.

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

		3b
-a		-3ab

10. Simplify the following expression.

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

11. What went wrong in this set of steps?

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

$-6xy-2x^3$

DIVIDING MULTIVARIABLE POLYNOMIALS

1. Set up but do not solve the long division problem.

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

2. Find the quotient.

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

3. Given the following long division, write the answer as

$$\text{quotient} + \frac{\text{remainder}}{\text{divisor}}$$

$$
\begin{array}{r}
x^2 - xy + y^2 \\
\hline
x+y \;\big|\; x^3+0x^2y+0xy^2+y^3 \\
\underline{x^3+x^2y} \\
-x^2y \\
\underline{-x^2y-xy^2} \\
xy^2 \\
\underline{xy^2+y^3} \\
-y^3
\end{array}
$$

4. How would you rewrite the expression before starting the long division process?

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

5. Find the quotient.

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

6. In words, what is the first question you should ask when solving this long division problem?

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

7. What went wrong in setting up the long division?

$$\frac{7x^3 + x^2y - 2xy^2 + y^3}{x - 2y}$$

$$7x^3 + x^2y - 2xy^2 + y^3 \overline{)\, x - 2y}$$

8. Fill in the blanks with the correct terms.

$$(2x - y)(\ \_\_\_\_\ ) = 6x^2 - 3xy$$

9. Find the quotient.

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


FOR THE LOVE OF MATH