ALBERT

Name _____ Date _____

Adding, Subtracting and Multiplying Polynomials Worksheet

Algebra 1 · Common Core HSA-APR.A.1

> Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Practice

Builds the skill step by step.

1. Add $(3x^2 + 2x - 1) + (x^2 - 5x + 4)$. What is the coefficient of x?

2. Add $(3x^2 + 2x - 1) + (x^2 - 5x + 4)$. What is the coefficient of x^2?

3. Which is $(5x - 3) - (2x + 4)$?

   A. $3x - 7$

   B. $3x + 1$

   C. $7x - 7$

   D. $3x - 1$

4. Multiply $(x + 3)(x + 4)$. What is the constant term?

5. Multiply $(x + 3)(x + 4)$. What is the coefficient of x?

6. Which is $2x(x - 5)$?

   A. $2x^2 - 5$

   B. $2x^2 - 10x$

   C. $2x - 10x$

   D. $x^2 - 10x$

7. Which is $(x - 2)^2$?

   A. $x^2 + 4$

   B. $x^2 - 4$

   C. $x^2 - 4x + 4$

   D. $x^2 - 2x + 4$

8. What is the degree of $(x^2 + 1)(x^3 - x)$?

9. What is always true about the sum of two polynomials?

   A. It is a number.

   B. It has degree 1.

   C. It is never a polynomial.

   D. It is a polynomial.

10. Which is $(4x^3 - x) - (x^3 + 2x)$?

    A. $3x^3 - 3x$

    B. $5x^3 + x$

    C. $3x^3 + x$

    D. $4x^3 - 3x$

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On Level

Grade-level practice.

1. Which is $(2x + 3)(x - 5)$?

   A. $2x^2 + 7x - 15$

   B. $2x^2 - 7x - 15$

   C. $2x^2 - 10x - 15$

   D. $2x^2 - 7x + 15$

2. Which is $(x + 1)(x^2 - x + 1)$?

   A. $x^3 - 1$

   B. $x^3 + 2x^2 + 1$

   C. $x^3 + 1$

   D. $x^3 + x + 1$

3. Multiply $(3x - 2)^2$. What is the coefficient of x?

4. Multiply $(x^2 + 2x)(x - 3)$. What is the coefficient of x^2?

5. Which is $(2a^2 - 3ab + b^2) - (a^2 + ab - 4b^2)$?

   A. $a^2 - 2ab - 3b^2$

   B. $3a^2 - 2ab - 3b^2$

   C. $a^2 - 4ab - 3b^2$

   D. $a^2 - 4ab + 5b^2$

6. Why are polynomials not closed under division?

   A. $x \div x^2 = 1/x$, which is not a polynomial.

   B. Division always gives 0.

   C. Division of polynomials is impossible.

   D. They are closed under division.

7. Which is $(x + 4)(x - 4)$?

   A. $x^2 + 16$

   B. $x^2 - 16$

   C. $x^2 - 8x - 16$

   D. $x^2 + 8x - 16$

8. What is the sum of the coefficients of $(x + 2)^3$ when it is multiplied out?

9. Explain how polynomials are like integers when you add, subtract and multiply them.

10. A rectangle has sides $2x + 1$ and $x - 3$. What is its perimeter?

    A. $3x - 2$

    B. $6x + 8$

    C. $6x - 4$

    D. $2x^2 - 5x - 3$

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Challenge

Multi-step and word problems that stretch it.

1. Which is $(x^2 + x + 1)(x^2 - x + 1)$?

   A. $x^4 + 1$

   B. $x^4 - x^2 + 1$

   C. $x^4 + 2x^2 + 1$

   D. $x^4 + x^2 + 1$

2. Multiply $(2x - 1)^3$. What is the coefficient of x?

3. A rectangle is $(x + 5)$ by $(x + 2)$. An x-by-x square is cut out of it. Which expression gives the area that is left?

   A. $7x + 10$

   B. $x^2 + 7x + 10$

   C. 10

   D. $7x$

4. Multiply $(x + 2)(x + 3)(x - 1)$. What is the coefficient of x^2?

5. Subtract $(3x^2 - 2x + 7) - (-x^2 + 5x - 7)$. What is the constant term?

6. $(3x + 3)(2x - 1) = 6x^2 + bx - 3$. What is b?

7. Which is $(x - y)(x^2 + xy + y^2)$?

   A. $x^3 + y^3$

   B. $x^3 - y^3$

   C. $(x - y)^3$

   D. $x^3 - 2xy - y^3$

8. A box has volume $x(x + 1)(x + 2)$. What is the volume when $x = 3$?

9. What is the degree of $(x^3 + 1)^2 - x^6$?

10. Which expression is a polynomial?

    A. $1/x$

    B. $\sqrt{x} + 1$

    C. $3x^2 - 2x + \frac{1}{2}$

    D. $x^{-2} + 4$