LESSON MAKER PRO

Polynomial Power Moves

Add, subtract, and multiply polynomial expressions.

HIGH SCHOOL · HSA-APR.A.1

CCSS.Math.Content.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."

NAME _____ DATE _____

THE BIG IDEA

To add or subtract polynomials, line up like terms and combine only terms with the same variable part. To multiply polynomials, use the distributive property so that every term in one factor multiplies every term in the other factor.

WORKED EXAMPLE

$(11x^4 - 8x^2 + 13) + (7x^4 + 5x^2 - 6)$

1. Group the like terms: $(11x^4 + 7x^4) + (-8x^2 + 5x^2) + (13 - 6)$.
2. Combine each group: $18x^4 - 3x^2 + 7$.

Answer: $18x^4 - 3x^2 + 7$

PRACTICE 6 problems

1 $(9x^2 - 4x + 12) + (3x^2 + 2x - 1)$

ANSWER _____

2 $(12x^2 + 9x - 4) - (3x^2 - 3x - 3)$

ANSWER _____

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

ANSWER _____

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

ANSWER _____

5 $(3x - 1)(4x + 2)$

ANSWER _____

6 $(12x^3 + 4x + 2) - (3x^3 + x - 1)$

ANSWER _____

APPLY IT Show your work

1 An esports club models the cost of streaming equipment as $9x^2 + 3x + 2$ dollars and the cost of event supplies as $3x^2 + x - 1$ dollars. Write a polynomial for the total cost.

WORK SPACE

ANSWER _____

2 A student film festival models its ticket revenue as $14x^2 + 4x + 12$ dollars and its expenses as $2x^2 + x + 3$ dollars. Write a polynomial for the festival's net earnings.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Multiply and simplify: $(2x^2 - 3x + 4)(3x^2 + 2x - 1)$

WORK SPACE AND ANSWER

ANSWER KEY

Polynomial Power Moves

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	$(9x^2 - 4x + 12) + (3x^2 + 2x - 1)$	**$12x^2 - 2x + 11$**
2	$(12x^2 + 9x - 4) - (3x^2 - 3x - 3)$	**$9x^2 + 12x - 1$**
3	$3x(4x^2 - 3x + 3)$	**$12x^3 - 9x^2 + 9x$**
4	$(x + 4)(x - 3)$	**$x^2 + x - 12$**
5	$(3x - 1)(4x + 2)$	**$12x^2 + 2x - 2$**
6	$(12x^3 + 4x + 2) - (3x^3 + x - 1)$	**$9x^3 + 3x + 3$**

PART 2 · APPLY IT

1. **$12x^2 + 4x + 1$ dollars** Add the two cost polynomials and combine the x^2 terms, x terms, and constants.
2. **$12x^2 + 3x + 9$ dollars** Subtract the expense polynomial from the revenue polynomial, then combine like terms.

CHALLENGE

$6x^4 - 5x^3 + 4x^2 + 11x - 4$

Accept equivalent expressions with terms written in a different order. For multiplication, students may show distribution with an area model or with expanded terms before combining like terms.