LESSON MAKER PRO

# Polynomial Power Moves

*Combine, distribute, divide, and simplify.*

**HIGH SCHOOL · A2.A.2.2**

**A2.A.2.2** "Add, subtract, multiply, divide, and simplify polynomial expressions."

NAME _____ DATE _____

### KEEP TERMS IN ORDER

When subtracting a polynomial, change the sign of every term you subtract. To multiply, distribute each term; to divide by a monomial, divide each term. Combine like terms to simplify.

### WORKED EXAMPLE

Simplify $(11x^2 + 13x) - (17x^2 - 19x)$.

1. Remove the parentheses: $11x^2 + 13x - 17x^2 + 19x$.
2. Group like terms: $(11 - 17)x^2 + (13 + 19)x$.
3. Simplify: $-6x^2 + 32x$.

**Answer: $-6x^2 + 32x$**

## PRACTICE 6 problems

**1** Add and simplify: $(3x^2 + 5x - 8) + (4x^2 - 2x + 9)$.

**ANSWER** _____

**2** Subtract and simplify: $(8x^2 - 3x + 4) - (2x^2 + 5x - 6)$.

**ANSWER** _____

**3** Multiply and simplify: $3x(2x^2 - 4x + 5)$.

**ANSWER** _____

**4** Multiply and simplify: $(x + 4)(x - 3)$.

**ANSWER** _____

**5** Divide and simplify $(12x^3 - 8x^2 + 4x)/(4x)$, where x is not 0.

**ANSWER** _____

**6** Simplify $2(x^2 + 3x - 4) - (x^2 - 5x + 2)$.

**ANSWER** _____

## APPLY IT Show your work

**1** For an esports tournament, x teams each pay a fee of $(2x + 4)$ dollars. The prize fund is $(x^2 + 3x)$ dollars. Write a simplified expression for the money left after the prize fund is paid.

WORK SPACE

**ANSWER** _____

**2** A club spends $(4x^2 + 12x)$ dollars to make $4x$ identical school spirit kits. What is the cost per kit? Assume x is a positive whole number.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A club's ticket income is $(x + 5)(2x + 3)$ dollars, and its expenses are $(x + 2)(x + 4)$ dollars. Write a simplified expression for its profit, then find the profit when $x = 6$.

WORK SPACE AND ANSWER

**ANSWER KEY** # Polynomial Power Moves

**HIGH SCHOOL · A2.A.2.2**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Add and simplify: $(3x^2 + 5x - 8) + (4x^2 - 2x + 9)$. | **$7x^2 + 3x + 1$** |
| 2 | Subtract and simplify: $(8x^2 - 3x + 4) - (2x^2 + 5x - 6)$. | **$6x^2 - 8x + 10$** |
| 3 | Multiply and simplify: $3x(2x^2 - 4x + 5)$. | **$6x^3 - 12x^2 + 15x$** |
| 4 | Multiply and simplify: $(x + 4)(x - 3)$. | **$x^2 + x - 12$** |
| 5 | Divide and simplify $(12x^3 - 8x^2 + 4x)/(4x)$, where x is not 0. | **$3x^2 - 2x + 1$** |
| 6 | Simplify $2(x^2 + 3x - 4) - (x^2 - 5x + 2)$. | **$x^2 + 11x - 10$** |

## PART 2 · APPLY IT

1. **$x^2 + x$ dollars** The total fees are $x(2x + 4) = 2x^2 + 4x$ dollars. Subtract the prize fund to get $x^2 + x$ dollars.
2. **x + 3 dollars per kit** Divide the total cost by the number of kits: $(4x^2 + 12x)/(4x) = x + 3$.

## CHALLENGE

**$x^2 + 7x + 7$ dollars; $85 when x = 6**

Accept equivalent simplified polynomial forms with terms in a different order. For the challenge, require both the profit expression and its value at x = 6.