LESSON MAKER PRO

Binomial Boost

Multiply linear expressions with fractions and integers.

GRADE 8 · MA.8.AR.1.2

MA.8.AR.1.2 "Apply properties of operations to multiply two linear expressions with rational coefficients."

NAME _____ DATE _____

MULTIPLY EVERY TERM

To multiply two linear expressions, use distribution so each term in one factor multiplies each term in the other factor. Then combine like terms and reduce fractions.

WORKED EXAMPLE

Simplify: $(2/3x - 5/4)(3/5x + 1/2)$

1. Distribute: $(2/3x)(3/5x) + (2/3x)(1/2) + (-5/4)(3/5x) + (-5/4)(1/2)$
2. Multiply each pair: $2/5x^2 + 1/3x - 3/4x - 5/8$
3. Combine the x terms: $1/3x - 3/4x = -5/12x$

Answer: $2/5x^2 - 5/12x - 5/8$

PRACTICE 6 problems

1 Simplify: $(x + 3)(x - 4)$

ANSWER _____

2 Simplify: $(1/6x + 4)(x - 3/8)$

ANSWER _____

3 Simplify: $(-2x + 1/3)(5x - 7)$

ANSWER _____

4 Simplify: $(3/7x - 2)(-1/5x + 9)$

ANSWER _____

5 Simplify: $(-3/2x - 1/4)(2/9x + 8)$

ANSWER _____

6 Simplify: $(5/6x - 7/3)(-3/4x - 1/5)$

ANSWER _____

APPLY IT Show your work

1 A student designs a rectangular esports team banner. Its width is (3/4x + 2) feet, and its height is (2/5x + 3) feet. Write a simplified expression for the area of the banner.

WORK SPACE

ANSWER _____

2 A rectangular photo backdrop for a school dance has a length of (7/8x - 1) yards and a width of (1/3x + 5) yards. Assume x gives positive dimensions. Write a simplified expression for its area.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify: (-3/4x + 2/5)(5/6x - 7/3)

WORK SPACE AND ANSWER

ANSWER KEY

Binomial Boost

GRADE 8 · MA.8.AR.1.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Simplify: (x + 3)(x - 4)	**$x^2 - x - 12$**
2	Simplify: (1/6x + 4)(x - 3/8)	**$1/6x^2 + 63/16x - 3/2$**
3	Simplify: (-2x + 1/3)(5x - 7)	**$-10x^2 + 47/3x - 7/3$**
4	Simplify: (3/7x - 2)(-1/5x + 9)	**$-3/35x^2 + 149/35x - 18$**
5	Simplify: (-3/2x - 1/4)(2/9x + 8)	**$-1/3x^2 - 217/18x - 2$**
6	Simplify: (5/6x - 7/3)(-3/4x - 1/5)	**$-5/8x^2 + 19/12x + 7/15$**

PART 2 · APPLY IT

1. **$3/10x^2 + 61/20x + 6$ square feet** Multiply the width and height expressions. Combine the two x terms, 9/4x and 4/5x, to get 61/20x.
2. **$7/24x^2 + 97/24x - 5$ square yards** Multiply the length and width expressions. Combine 35/8x and -1/3x to get 97/24x.

CHALLENGE

$-5/8x^2 + 25/12x - 14/15$

Accept equivalent expanded expressions with terms in a different order. For a fully simplified response, like terms should be combined and fractions should be reduced.