LESSON MAKER PRO

Fraction Expression Fix

Combine, multiply, and divide rational algebraic expressions.

HIGH SCHOOL · MA.912.AR.1.9

MA.912.AR.1.9 "Apply previous understanding of rational number operations to add, subtract, multiply and divide rational algebraic expressions."

NAME _____ DATE _____

WORK WITH DENOMINATORS

To add or subtract rational expressions, rewrite them with a common denominator, then combine only the numerators. To multiply or divide, factor when useful, multiply by the reciprocal when dividing, and cancel common factors. Exclude any value that makes an original denominator equal to zero.

WORKED EXAMPLE

Simplify: 7x/15 + 11/10

1. Find the LCD of 15 and 10, which is 30.
2. Rewrite: 7x/15 = 14x/30 and 11/10 = 33/30.
3. Add the numerators: (14x + 33)/30.

Answer: (14x + 33)/30

PRACTICE 6 problems

1 Simplify: x/4 + 5/8

ANSWER _____

2 Simplify: 8/x - 2/x, where x != 0.

ANSWER _____

3 Simplify: (x + 2)/5 * 6/x, where x != 0.

ANSWER _____

4 Simplify: 4x/9 ÷ 8/x, where x != 0.

ANSWER _____

5 Simplify: x/8 - 1/4

ANSWER _____

6 Simplify: (x + 4)/8 ÷ (x + 4)/2, where x != -4.

ANSWER _____

APPLY IT Show your work

1 A club splits a $48 event setup fee equally among x students. Each student also buys a $5 shirt. Write a simplified expression for the total cost per student, where x is positive.

WORK SPACE

ANSWER _____

2 A robotics team has (x + 8)/6 kilograms of filament. Each prototype uses 2/x kilograms of filament. Write a simplified expression for the number of prototypes the team can make, where x is positive.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify and state the excluded value: (x/4 - 2/5) ÷ x/8

WORK SPACE AND ANSWER

ANSWER KEY

Fraction Expression Fix

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Simplify: x/4 + 5/8	**(2x + 5)/8**
2	Simplify: 8/x - 2/x, where x != 0.	**6/x**
3	Simplify: (x + 2)/5 * 6/x, where x != 0.	**6(x + 2)/(5x)**
4	Simplify: 4x/9 ÷ 8/x, where x != 0.	**x^2/18**
5	Simplify: x/8 - 1/4	**(x - 2)/8**
6	Simplify: (x + 4)/8 ÷ (x + 4)/2, where x != -4.	**1/4**

PART 2 · APPLY IT

1. **(5x + 48)/x dollars** The setup cost per student is 48/x dollars. Add the shirt cost: 48/x + 5 = (5x + 48)/x.
2. **x(x + 8)/12** Divide the total filament by the filament per prototype: (x + 8)/6 ÷ 2/x. Multiply by the reciprocal and simplify to x(x + 8)/12.

CHALLENGE

2(5x - 8)/(5x), where x != 0

Accept equivalent simplified forms, including (48 + 5x)/x for the first word problem. For division expressions, students should keep all restrictions from the original expression, even if factors cancel.