Adding And Subtracting Rational Algebraic Expressions Worksheet

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Part 1: Building a Foundation

What is a rational algebraic expression?

Hint: Think about the definition involving fractions and polynomials.

- ◯ A) A fraction with integers in the numerator and denominator
- ◯ B) A fraction with polynomials in the numerator and denominator
- ◯ C) A polynomial with a single variable
- ◯ D) A polynomial with no variables

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Which of the following are examples of rational algebraic expressions? (Select all that apply)

Hint: Look for fractions that have polynomials in both the numerator and denominator.

- ☐ A) \(\frac{x^2 + 3x + 2}{x - 1} \)

- [ ] B) $x^2 + 3x + 2$
- [ ] C) $\frac{5}{x + 2}$
- [ ] D) $\frac{3x + 1}{2x^2 - 5x + 3}$

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Explain the process of finding a common denominator when adding rational expressions.

Hint: Consider the factors of the denominators involved.

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Part 2: comprehension

Why is it necessary to find a common denominator when adding or subtracti ng rational expressions?

Hint: Consider the role of denominators in addition and subtraction.

- ◯ A) To make the numerators equal
- ◯ B) To simplify the expressions
- ◯ C) To ensure the denominators are the same for accurate addition or subtraction
- ◯ D) To factor the expressions

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Hint: Think about the operation being performed.

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Which of the following statements are true about simplifying rational expressions? (Select all that apply)

Hint: Think about the rules of cancelation and factoring.

- ☐ A) You can cancel terms in the numerator and denominator without factoring.
- ☐ B) You must factor both the numerator and the denominator before cancel ing common factors.
- ☐ C) Simplifying involves only adding or subtract ing the numerators.
- ☐ D) Simplifying can change the expression's value.

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Describe how factoring polynomials aids in simplifying rational expressions.

Hint: Consider the relationship between factors and simplification.

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Part 3: Application and Analysis

What is the least common denominator of \(\frac{1}{x^2 - 1} \) and \(\frac{2}{x + 1} \)?

Hint: Think about the factors of the denominators.

- ◯ A) \(x^2 - 1 \)
- ◯ B) \(x + 1 \)
- ◯ C) \((x - 1)(x + 1) \)

◯ D) \(x^2 + 1 \)

What is the least common denominator of \(\frac{1}{x^2 - 1} \) and \(\frac{2}{x + 1} \)?

Hint: Consider the factors of each denominator.

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What is the least common denominator of \(\frac{1}{x^2 - 1} \) and \(\frac{2}{x + 1} \)?

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Given \(\frac{3}{x + 2} + \frac{5}{x - 2} \), what steps are necessary to add these expressions? (Select all that apply)

Hint: Consider the process of adding fractions.

☐ A) Find the least common denominator
☐ B) Add the numerators directly
☐ C) Rewrite each fraction with the common denominator
☐ D) Simplify the resulting expression

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Solve the following: \(\frac{2x}{x^2 - 4} + \frac{3}{x + 2} \).

Hint: Consider factoring the denominators.

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Hint: Consider factoring the denominators first.

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Hint: Consider factoring the denominators.

Which expression is equivalent to \(\frac{x^2 - 4}{x^2 - 1} \) after simplification?

Hint: Think about factoring both the numerator and denominator.

- ◯ A) $\frac{x - 2}{x - 1}$
- ◯ B) $\frac{x + 2}{x + 1}$
- ◯ C) $\frac{(x - 2)(x + 2)}{(x - 1)(x + 1)}$
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Part 4: Evaluation and Creation

After simplifying $\frac{x^2 - 1}{x^2 + 2x + 1}$, what conclusion can be drawn about the expression?

Hint: Consider the result of the simplification.

- ◯ A) It simplifies to 1
- ◯ B) It simplifies to $\frac{x - 1}{x + 1}$
- ◯ C) It simplifies to $\frac{x + 1}{x - 1}$
- ◯ D) It cannot be simplified

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Evaluate the expression \(\frac{x^2 - 4}{x^2 - 4x + 4} \) and determine which of the following are correct? (Select all that apply)

Hint: Consider the values that make the expression undefined.

- ☐ A) The expression is undefined for \(x = 2 \).
- ☐ B) The expression simplifies to \(\frac{x + 2}{x - 2} \).
- ☐ C) The expression is a rational function.
- ☐ D) The expression has a hole at \(x = 2 \).

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Create a real-world scenario where adding or subtractin rational expressions would be necessary, and solve it.

Hint: Think about situations involving rates or ratios.

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