Rational Expressions Worksheet

Rational Expressions Worksheet

Disclaimer: *The rational expressions worksheet was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at max@studyblaze.io.*

Part 1: Building a Foundation

What is a rational expression?

Hint: Think about the definition involving fractions and polynomials.

- ◯ A) A fraction with a constant numerator and denominator
- ◯ B) A fraction where the numerator and the denominator are polynomials
- ◯ C) A polynomial with no fractions
- ◯ D) A number divided by zero

Which of the following are components of a rational expression?

Hint: Consider the parts that make up a fraction.

- ☐ A) Numerator
- ☐ B) Denominator
- ☐ C) Exponent
- ☐ D) Coefficient

Explain why it is important to identify the domain of a rational expression.

Hint: Think about the values that make the expression undefined.

List two methods used to simplify rational expressions.

Hint: Think about factoring and cancelation.

1. Method 1

2. Method 2

What is the first step in simplifying the rational expression \(\frac{x^2 - 9}{x^2 - 3x}\)?

Hint: Consider how you would start simplifying a fraction.

- ◯ A) Multiply the numerator and denominator
- ◯ B) Add 3 to both the numerator and denominator
- ◯ C) Factor both the numerator and the denominator
- ◯ D) Divide the numerator by the denominator

Part 2: Application and Analysis

What is the simplified form of \(\frac{2x^2 + 4x}{4x}\)?

Hint: Look for common factors in the numerator and denominator.

- ◯ A) \(x + 2\)
- ◯ B) \(2x + 4\)
- ◯ C) \(\frac{x}{2} + 1\)
- ◯ D) \(x + 1\)

When solving the equation \(\frac{x}{x+2} = \frac{3}{x-2}\), which steps are necessary?

Hint: Think about how to eliminate the fractions.

- ☐ A) Cross-multiply
- ☐ B) Add 2 to both sides
- ☐ C) Find a common denominator
- ☐ D) Factor the numerators

Solve the rational equation \(\frac{3}{x} = \frac{6}{x+2}\) and explain your steps.

Hint: Consider how to isolate the variable.

If $\frac{x+1}{x-1} = \frac{2}{3}$, what is the value of x?

Hint: Cross-multiply to solve for x.

- ◯ A) 1
- ◯ B) 3
- ◯ C) 5
- ◯ D) 7

Which of the following statements are true about the expression $\frac{x^2 - 4}{x^2 - x - 6}$?

Hint: Consider the properties of rational expressions.

- ☐ A) It can be simplified by factoring
- ☐ B) The domain excludes $x = 2$
- ☐ C) The domain excludes $x = -3$
- ☐ D) It is already in its simplest form

Part 3: Evaluation and Creation

Which of the following rational expressions is equivalent to $\frac{x^2 - 4x + 4}{x^2 - 2x}$?

Hint: Look for common factors in the numerator and denominator.

- ◯ A) $\frac{x-2}{x}$
- ◯ B) $\frac{x-2}{x-1}$
- ◯ C) $\frac{x}{x-2}$
- ◯ D) $\frac{x+2}{x-2}$

Evaluate the following expressions and determine which are equivalent to $\frac{x^2 - 9}{x^2 - 3x}$.

Hint: Consider the factored forms of the expressions.

- ☐ A) $\frac{x+3}{x}$

- [ ] B) \(\frac{x-3}{x}\)
- [ ] C) \(\frac{x+3}{x-3}\)
- [ ] D) \(\frac{x-3}{x-3}\)

Create a real-world problem that can be modeled using the rational expression \(\frac{ d }{ t }\), where \(d \) is distance and \(t \) is time. Describe the scenario and how the expression is used.

Hint: Think about situations involving speed or rates.