

Section 4.4: Adding and Subtracting Rational Expressions

Adding or Subtracting Rational Expressions

Recall: $\frac{1}{3} + \frac{1}{4}$

When adding or subtracting rational numbers, you must get a **lowest common denominator**.

Adding or Subtracting Rational Expressions:

1. Factor the numerators and denominators of both expressions, if possible.
2. Determine the lowest common denominator (LCD).
3. Rewrite each rational expression as an equivalent expression with the LCD as the denominator.
4. Add or subtract the numerators of the equivalent expressions while keeping the denominator the same.
5. Simplify the rational expression and restate the restrictions.



Example 1: Simplify and state the restrictions.

$$\frac{x-4}{x-2} - \frac{x-10}{x-2}$$

NOTE:
Same Denominator!

YOUR TURN:

Simplify and state the restrictions.

$$\frac{x^2}{x+1} - \frac{1}{x+1}$$



Example 2: (ex. 2, p. 246)

Simplify and state the restrictions.

$$\frac{3}{8x^2} + \frac{1}{4x}$$

NOTE:
One denominator is a
multiply of another.

YOUR TURN:

Simplify and state the restrictions.

$$\frac{3}{x+5} - \frac{1}{4x+20}$$

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Example 3: (ex. 3, p. 246)

Simplify: $\frac{3n}{2n+1} - \frac{4}{n-3}$

NOTE:
Denominators do not have
any common factors.

YOUR TURN:

Simplify and state the restrictions.

$$\frac{3}{2x} - \frac{4}{x-1}$$



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Example 4: (ex. 4, p. 247)

Simplify:

$$\frac{32}{x^2 - 16} + \frac{4}{x + 4}$$

NOTE:
The denominators
have a common factor.

YOUR TURN:

Simplify and state the restrictions.

$$\frac{7}{x^2 - 9} - \frac{1}{4x + 12}$$

Practice Questions:

p. 249 - 250, #1bd, 3bc, 4ab, 5bc, 6ac, 7b, 8a, 9