Objectives

- Simplify complex fractions by simplifying the numerator and denominator.
- Simplify rational expressions with negative exponents.

7.3 Complex Fractions

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Complex Fraction

- A **complex fraction** is

Simplifying a Complex Fraction

1. _____ and simplify the numerator and denominator separately.
2. _____ by multiplying the numerator by the _____ of the denominator.
3. _____ the resulting fraction if possible.

Example 1

Simplify.

$$\frac{\frac{2}{5}+\frac{1}{4}}{\frac{1}{2}+\frac{1}{3}}$$

Example 2

Simplify.

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

Example 3

Simplify.

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

Example 4

Simplify.

$$\frac{3y + \frac{4}{y+1}}{2y - \frac{3}{y}}$$

Example 5

Simplify.

$$\frac{\frac{5}{y+2}}{\frac{-3}{y^2-4}}$$

Example 6

Simplify.

$$\frac{\frac{1}{a} - \frac{1}{b}}{\frac{1}{a^2} - \frac{1}{b^2}}$$

Example 7

Simplify.

$$\frac{x^{-2} + y^{-1}}{x^{-1} - 5y^{-3}}$$

Example 13

Simplify.

$$\frac{a^{-3} + 2b^{-1}}{b + 2a^3}$$