

6.3 Adding and Subtracting Rational Expressions

Simplify:

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

$$\frac{3}{5} - \frac{9}{20}$$

Find the LOWEST common denominator by multiplying both numerator and denominator by the same value. When adding or subtracting, do not expand the denominator.

Example 1: Add or subtract and simplify

a.) $\frac{1}{3a} + \frac{2}{3a}$

b.) $\frac{5}{m} + \frac{3}{m^2}$

$$c.) \frac{x-2}{4x^2} - \frac{x+6}{6x}$$

Try:

$$a.) \frac{1}{6xy} - \frac{2}{15^2}$$

$$b.) \frac{x+5}{8x} + \frac{x-7}{6x^2}$$

Example 2: Add or subtract and simplify

a.) $\frac{4n}{n+4} + \frac{3n}{n-5}$

b.) $\frac{x+1}{3x+5} - \frac{5x}{x-1}$

Try:

$$\frac{p}{p-3} - \frac{3p}{p+2}$$

Example 3: Add or subtract and simplify

a.)

$$\frac{5}{x^2 - 25} + \frac{4}{x^2 + 10x + 25}$$

b.)

$$\frac{n - 2}{n^2 - 5n + 6} - \frac{n + 4}{n^2 - 11n + 30}$$

c.)

$$\frac{n-2}{n^2-5n+6} - \frac{n+4}{n^2-11n+30}$$

Try:

a.)

$$\frac{7}{x^2-49} - \frac{4}{x^2+14x+49}$$

b.)

$$\frac{n-3}{n^2+3n-18} - \frac{n-2}{n^2+n-20}$$

Example 4: Simplify the following Complex fraction

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