

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Notes

Algebra Section 12.6

Pages 812-819



**Goal:** “You will add and subtract rational expressions”

**Add/subtract rational expressions with the same denominator:**

**Ex:**  $\frac{5}{3x} + \frac{7}{3x}$

**Ex:**  $\frac{3x}{x-1} - \frac{x+5}{x-1}$

**Ex:**  $\frac{2}{y} + \frac{y+1}{y}$

$\frac{12}{3x} = \frac{4}{x}$

$\frac{2x-5}{x-1}$

$\frac{y+3}{y}$

**Ex:**  $\frac{4x+1}{2x-1} - \frac{2x-3}{2x-1}$

**Ex:**  $\frac{2x}{x+2} + \frac{x+1}{x+2}$

**Ex:**  $\frac{4x+1}{5x} - \frac{x+2}{5x}$

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

$\frac{3x+1}{x+2}$

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

**Find least common denominator:**

**\*\*HINT:** If you had  $\frac{2}{721} + \frac{3}{648}$  what would be the quickest way to find a common denominator? **Multiply the denominators together.**

**Ex:**  $\frac{1}{4r}$  and  $\frac{r+3}{10r^2}$

**Ex:**  $\frac{5}{(x-3)^2}$  and  $\frac{3x+4}{x^2-x-6}$

**Ex:**  $\frac{3}{c-2}$  and  $\frac{c+8}{2c+7}$

**LCD:**  $20r^2$

**LCD:**  $(x-3)^2(x+2)$

**LCD:**  $(c-2)(2c+7)$

**Add expressions with different denominators:**

**Ex:**  $\frac{9}{8x^2} + \frac{5}{12x^3}$

$$\frac{9}{8x^2} \cdot \frac{3x}{3x} + \frac{5}{12x^3} \cdot \frac{2}{2}$$

$$\frac{27x}{24x^3} + \frac{10}{24x^3}$$

$$\frac{27x+10}{24x^3}$$

**Ex:**  $\frac{10}{3x} - \frac{7x}{x+2}$

$$\frac{10}{3x} \cdot \frac{(x+2)}{(x+2)} - \frac{7x}{x+2} \cdot \frac{3x}{3x}$$

$$\frac{10(x+2)}{3x(x+2)} - \frac{21x^2}{3x(x+2)}$$

$$\frac{-21x^2+10x+20}{3x(x+2)}$$

**Ex:**  $\frac{6}{18x} + \frac{4}{6x^2}$

$$\frac{6x}{18x^2} + \frac{12}{18x^2}$$

$$\frac{6x+12}{18x^2}$$

$$\frac{6(x+2)}{18x^2}$$

$$\frac{x+2}{3x^2}$$

**Ex:**  $\frac{5}{2x} - \frac{3x}{x-1}$

$$\frac{5(x-1)}{2x(x-1)} - \frac{6x^2}{2x(x-1)}$$

$$\frac{-6x^2+5x-5}{2x(x-1)}$$

**Ex:**  $\frac{3}{2x} + \frac{7}{5x^4}$

$$\frac{15x^3+14}{10x^4}$$

**Ex:**  $\frac{y}{y+1} + \frac{3}{y+2}$

$$\frac{y^2+5y+3}{(y+1)(y+2)}$$

$$\mathbf{Ex:} \quad \frac{x+4}{x^2+3x-10} - \frac{x-1}{x^2+2x-8}$$

$$\frac{x+4}{(x-2)(x+5)} - \frac{x-1}{(x+4)(x-2)}$$

$$\frac{x+4}{(x-2)(x+5)} \cdot \frac{(x+4)}{(x+4)} - \frac{x-1}{(x+4)(x-2)} \cdot \frac{x+5}{x+5}$$

$$\frac{(x+4)(x+4)}{(x-2)(x+5)(x+4)} - \frac{(x-1)(x+5)}{(x-2)(x+5)(x+4)}$$

$$\frac{x^2+8x+16-x^2-4x+5}{(x-2)(x+5)(x+4)}$$

$$\frac{4x+21}{(x-2)(x+4)(x+5)}$$

$$\mathbf{Ex:} \quad \frac{2z-1}{z^2+2z-8} - \frac{z+1}{z^2-4}$$

$$\frac{2z-1}{(z+4)(z-2)} - \frac{z+1}{(z+2)(z-2)}$$

$$\frac{2z-1}{(z+4)(z-2)} \cdot \frac{(z+2)}{(z+2)} - \frac{z+1}{(z+2)(z-2)} \cdot \frac{(z+4)}{(z+4)}$$

$$\frac{(2z-1)(z+2)}{(z+4)(z-2)(z+2)} - \frac{(z+1)(z+4)}{(z+4)(z-2)(z+2)}$$

$$\frac{2z^2+3z-2-z^2-5z-4}{(z+4)(z+2)(z-2)}$$

$$\frac{z^2-2z-6}{(z+4)(z-2)(z+2)}$$

$$\mathbf{Ex:} \quad \frac{x+3}{x^2-8x+15} - \frac{x+6}{x^2-x-20}$$

$$\frac{4x+30}{(x-3)(x-5)(x+4)}$$