

Add the following rational expressions.
Identify any excluded values.

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

$$\text{LCD: } (x+2)(x+1)$$

$$\frac{5}{(x+2)(x+1)} + \frac{x^2 + 4x + 3}{(x+2)(x+1)} = \frac{x^2 + 4x + 8}{(x+2)(x+1)}$$

$$x \neq -2, -1$$

Add the following rational expressions.
Identify any excluded values.

$$\frac{4}{(x+5)} + \frac{x}{(x+5)} = \frac{x+4}{(x+5)}$$

$$\text{LCD: } (x+5)$$

Subtracting Rationals

Subtract the rational numbers

$$\frac{2}{2} \cdot \frac{3}{5} - \frac{3}{10}$$

$$\frac{6}{10} - \frac{3}{10} = \frac{3}{10}$$

$$\frac{2}{2} \cdot \frac{5}{4} - \frac{3}{8}$$

$$\frac{10}{8} - \frac{3}{8} = \frac{5}{8}$$

$$\frac{2}{3} \cdot \frac{2}{3} - \frac{5}{9}$$

$$\frac{4}{9} - \frac{5}{9} = \frac{-1}{9}$$

$$\frac{2}{5} - 2 \cdot \frac{5}{5}$$

$$-\frac{2}{5} - \frac{10}{5} = \frac{-12}{5}$$

Subtract the Rational Expressions

$$\frac{x}{x} \cdot \frac{1}{(x-2)} - \frac{2}{x} \cdot \frac{(x-2)}{(x-2)} \cdot \frac{x}{x} \quad \text{LCD: } (x-2)(x)$$

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

$$|x + (-2x+4) = -x+4$$

$$\frac{(x+1)}{(x+1)} \cdot \frac{x}{5} - \frac{3}{(x+1)} \cdot \frac{5}{5}$$

LCD: $5(x+1)$

$$\frac{x^2+x}{5(x+1)} + \frac{(-15)}{5(x+1)} = \frac{x^2+x-15}{5(x+1)}$$

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

LCD: $(x+2)(x+1)$

$$\frac{(x^2+x+x+1)}{(x+1)(x+2)} + \frac{(-4x-8)}{(x+1)(x+2)} = \frac{x^2-2x-7}{(x+1)(x+2)}$$

Subtract the following rational expressions.
Identify any excluded values.

$$\frac{12x}{(x+5)} - \frac{5}{(x+5)(x+4)} \cdot \frac{15}{15}$$

$$\frac{15x+60}{(x+5)(x+4)} \rightarrow 15(x+4)$$

LCD: $15(x+4)(x+5)$

$$\frac{12x^2+60x}{15(x+4)(x+5)} + \frac{(-75)}{15(x+5)(x+4)}$$

$$\frac{12x^2+60x-75}{15(x+4)(x+5)}$$

$$x \neq -4, -5$$

Subtract and identify any excluded values.

$$\frac{\overset{(x+2)}{\cancel{(x+2)}} \cdot x^2}{\overset{(x+2)}{\cancel{(x+2)}}(x+4)} - \frac{1}{(x+2)} \cdot \frac{\overset{(x+4)}{\cancel{(x+4)}}}{\overset{(x+4)}{\cancel{(x+4)}}}$$

$$\text{LCD: } (x+4)(x+2)$$

$$\frac{x^3 + 2x^2}{(x+4)(x+2)} + \frac{\overset{(-1)}{\cancel{(x+4)}}}{(x+4)(x+2)} = \frac{x^3 + 2x^2 - x - 4}{(x+4)(x+2)}$$

$$x \neq -4, -2$$

subtract the following rational expressions.
Identify any excluded values.

$$\frac{\overset{(x-2)}{\cancel{(x-2)}} \cdot 3x}{\overset{(x-2)}{\cancel{(x-2)}}(x+5)} - \frac{7}{(x+5)(x-2)}$$

$$\text{LCD: } (x+5)(x-2)$$

$$\frac{3x^2 - 6x}{(x-2)(x+5)} + \frac{-7}{(x+5)(x-2)} = \frac{3x^2 - 6x - 7}{(x+5)(x-2)}$$

$$x \neq -5, 2$$

Subtract the following rational expressions.
Identify any excluded values.

$$\frac{\overbrace{(x+1)}^{\text{blue}} \cdot 3x}{\overbrace{(x+1)}^{\text{red}} (x-6)(x+1)} - \frac{2 \cdot \overbrace{(x-6)}^{\text{blue}}}{\underbrace{(x+1)(x+1)}_{\text{blue}} \cdot \overbrace{(x-6)}^{\text{red}}}$$

$$LCD: (x-6)(x+1)(x+1)$$

$$\frac{3x^2 + 3x}{(x-6)(x+1)(x+1)} + \frac{-2x + 12}{(x-6)(x+1)(x+1)}$$

$$\frac{3x^2 + x + 12}{(x-6)(x+1)(x+1)}$$

$$x \neq 6, -1$$

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