8.5 Adding & Subtracting Rational Expressions

Refresh!

① $\frac{3}{4} + \frac{6}{4} = \frac{9}{4}$

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

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

③ $\frac{4}{4} \cdot \frac{7}{9} - \frac{5}{4} \cdot \frac{9}{9}$

$\frac{28}{36} - \frac{45}{36}$

$\boxed{\frac{-17}{36}}$

Add or Subtract!

④ $\frac{7}{4x} + \frac{3}{4x} = \frac{10}{4x}$

$= \boxed{\frac{5}{2x}}$

⑤ $\frac{2x}{x+6} - \frac{5}{x+6}$

$\boxed{\frac{2x-5}{x+6}}$

⑥ $\frac{x+6}{4x} + \frac{9}{2x} \cdot \frac{2}{2}$

$\frac{x+6}{4x} + \frac{18}{4x}$

$\boxed{\frac{x+24}{4x}}$

⑦ $\frac{7}{3x} + \frac{x}{3x^2+3x}$ LCD: $3x(x+1)$

$\frac{(x+1)}{(x+1)} \cdot \frac{7}{3x} + \frac{x}{3x(x+1)}$

$\frac{7(x+1) + x}{3x(x+1)} = \frac{7x+7+x}{3x^2+3x}$

$= \boxed{\frac{8x+7}{3x^2+3x}}$

⑧ $\frac{(x+2)}{(2x-2)} - \frac{(-2x-1)}{(x^2-4x+3)}$ LCD: $2(x-1)(x-3)$

$\frac{(x-3)}{(x-3)} \cdot \frac{x+2}{2(x-1)} - \frac{(-2x-1)}{(x-3)(x-1)} \cdot \frac{2}{2}$

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

$\frac{x^2+2x-3x-6-(-4x-2)}{2(x^2-3x-x+3)}$

$\frac{x^2-x-6+4x+2}{2x^2-8x+6}$

$\frac{x^2+3x-4}{2x^2-8x+6}$

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

$= \boxed{\frac{x+4}{2x-6}}$

⑨ $\frac{x}{\quad} + \frac{5}{\quad}$

⑩ $\frac{x+1}{\quad} - \frac{6}{\quad}$

(9) $\frac{x}{x^2-x-12} + \frac{5}{12x-48}$

$(x-4)(x+3)$ $\quad 12(x-4)$

LCD: $12(x-4)(x+3)$

$\frac{12}{12}\cdot\frac{x}{(x-4)(x+3)} + \frac{5}{12(x-4)}\cdot\frac{(x+3)}{(x+3)}$

$\frac{12x + 5(x+3)}{12(x-4)(x+3)}$

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

$\boxed{\frac{17x+15}{12x^2-12x-144}}$

(10) $\frac{x+1}{x^2+4x+4} - \frac{6}{x^2-4}$

$(x+2)(x+2)$ $\quad (x-2)(x+2)$

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

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

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

$\frac{x^2-x-2-6x-12}{(x^2-4)(x+2)}$

$\boxed{\frac{x^2-7x-14}{x^3+2x^2-4x-8}}$