

Adding / subtracting rational expressions

$$\textcircled{1} \quad \frac{3}{x} + \frac{5}{x} = \frac{8}{x}$$

$$\textcircled{2} \quad \frac{9}{x} - \frac{4}{x} = \frac{5}{x}$$

$$\textcircled{3} \quad \frac{5}{x} + \frac{4}{2x} = \frac{2 \times 5}{2 \times x} + \frac{4}{2x} = \frac{10}{2x} + \frac{4}{2x} = \frac{14}{2x} = \frac{7}{x}$$

$$\textcircled{4} \quad \frac{7}{3x} + \frac{6}{x} = \frac{7}{3x} + \frac{3 \times 6}{3 \times x} = \frac{7}{3x} + \frac{18}{3x} = \frac{7+18}{3x} = \frac{25}{3x}$$

$$\textcircled{5} \quad \frac{2}{5x} - \frac{3}{x} = \frac{2}{5x} - \frac{5 \times 3}{5 \times x} = \frac{2}{5x} - \frac{15}{5x} = \frac{2-15}{5x} = \frac{-13}{5x}$$

$$\textcircled{6} \quad \frac{3}{x^2} + \frac{7}{x} = \frac{3}{x^2} + \frac{7 \times x}{x \times x} = \frac{3}{x^2} + \frac{7x}{x^2} = \frac{3+7x}{x^2}$$

$$\textcircled{7} \quad \frac{5}{x^2} + \frac{3}{x^3} = \frac{5 \times x}{x^2 \times x} + \frac{3}{x^3} = \frac{5x}{x^3} + \frac{3}{x^3} = \frac{5x+3}{x^3}$$

$$\textcircled{8} \quad \frac{4}{x} + \frac{3}{y} = \frac{4xy}{x \times y} + \frac{3yx}{y \times x} = \frac{4y+3x}{xy}$$

$$\textcircled{9} \quad \frac{5}{x} - \frac{4}{y} = \frac{5y}{xy} - \frac{4x}{xy} = \frac{5y-4x}{xy}$$

$$\textcircled{10} \quad \frac{x}{y} - \frac{y}{x} = \frac{x^2}{xy} - \frac{y^2}{xy} = \frac{x^2-y^2}{xy}$$

$$\textcircled{11} \quad 4x + \frac{x}{3} = \frac{4x}{1} + \frac{x}{3} = \frac{12x}{3} + \frac{x}{3} = \frac{13x}{3}$$

$$\textcircled{12} \quad 4x + \frac{3}{x} = \frac{4x}{1} + \frac{3}{x} = \frac{4x \times x}{1 \times x} + \frac{3}{x} = \frac{4x^2+3}{x}$$

$$\textcircled{13} \quad \frac{3x}{4} + \frac{2x}{3} = \frac{3x \times 3}{4 \times 3} + \frac{2x \times 4}{3 \times 4} = \frac{9x}{12} + \frac{8x}{12} = \frac{17x}{12}$$

$$\textcircled{14} \quad \frac{2}{3x} + \frac{4}{2x} = \frac{2 \times 2}{3x \times 2} + \frac{4 \times 3}{2x \times 3} = \frac{4}{6x} + \frac{12}{6x}$$
$$= \frac{8+12}{6x} = \frac{8}{3x}$$