

Sčítání, odčítání lomených výrazů

Příklady

$$1) \frac{3x-1}{8} + \frac{4-2x}{4}$$

$$2) \frac{2-5x}{3} - \frac{3-x}{4}$$

$$3) \frac{3a-6}{5} - \frac{2+3a}{10}$$

$$4) \frac{x-2}{2x} + \frac{5-2x}{6x}$$

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

$$6) \frac{y}{y+1} - \frac{2y+3}{2y}$$

$$7) \frac{3x+1}{x-1} + \frac{4-x}{x+1}$$

$$8) 2 + \frac{x+2}{x-4}$$

$$9) 3 - \frac{x+2}{6x}$$

$$10) \frac{2x+5}{x-2} + \frac{4+3x}{2x-4}$$

$$11) \frac{2}{x} - \frac{3x+2}{x^2+2x}$$

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

$$13) \frac{5-3x}{x^2-4x} - \frac{5}{3x-12}$$

$$14) \frac{3x+2}{9x^2+6x+1} - \frac{2-3x}{3x+1}$$

$$15) \frac{3a+1}{5a-4} + \frac{4-3a}{25a^2-16}$$

$$16) \frac{4}{3a+2} + \frac{4-3a}{9a^2-4}$$

$$17) \frac{3x-2}{x^2+6x+9} - \frac{2-x}{x+3}$$

Řešení

$$1) \frac{3x-1}{8} + \frac{4-2x}{4} = \frac{1 \cdot (3x-1) + 2 \cdot (4-2x)}{8} = \frac{3x-1+8-4x}{8} = \frac{-x+7}{8}$$

$$2) \frac{2-5x}{3} - \frac{3-x}{4} = \frac{4 \cdot (2-5x) - 3 \cdot (3-x)}{12} = \frac{8-20x-9+3x}{12} = \frac{-17x-1}{12}$$

$$3) \frac{3a-6}{5} - \frac{2+3a}{10} = \frac{2 \cdot (3a-6) - 1 \cdot (2+3a)}{10} = \frac{6a-12-2-3a}{10} = \frac{3a-14}{10}$$

$$4) \frac{x-2}{2x} + \frac{5-2x}{6x} = \frac{3 \cdot (x-2) + 1 \cdot (5-2x)}{6x} = \frac{3x-6+5-2x}{6x} = \frac{x-1}{6x}$$

$$5) \frac{y+2}{y} - \frac{y-4}{y-1} = \frac{(y-1)(y+2) - y(y-4)}{y \cdot (y-1)} = \frac{y^2+2y-y-2-y^2+4y}{y \cdot (y-1)} = \frac{5y-2}{y \cdot (y-1)}$$

$$6) \frac{y}{y+1} - \frac{2y+3}{2y} = \frac{2y \cdot y - (y+1)(2y+3)}{2y \cdot (y+1)} = \frac{2y^2 - (2y^2+3y+2y+3)}{2y \cdot (y+1)} = \frac{2y^2 - 2y^2 - 3y - 2y - 3}{2y \cdot (y+1)} = \frac{-5y-3}{2y \cdot (y+1)}$$

$$7) \frac{3x+1}{x-1} + \frac{4-x}{x+1} = \frac{(x+1)(3x+1) + (x-1)(4-x)}{(x-1)(x+1)} = \frac{3x^2+x+3x+1+4x-x^2-4+x}{(x-1)(x+1)} = \frac{2x^2+9x-3}{(x-1)(x+1)}$$

$$8) 2 + \frac{x+2}{x-4} = \frac{2}{1} + \frac{x+2}{x-4} = \frac{2(x-4) + x+2}{x-4} = \frac{2x-8+x+2}{x-4} = \frac{3x-6}{x-4}$$

$$9) 3 - \frac{x+2}{6x} = \frac{3}{1} - \frac{x+2}{6x} = \frac{3 \cdot 6x - 1 \cdot (x+2)}{6x} = \frac{18x-x-2}{6x} = \frac{17x-2}{6x}$$

$$\begin{aligned}
 10) \quad \frac{2x+5}{x-2} + \frac{4+3x}{2x-4} &= \frac{2x+5}{x-2} + \frac{4+3x}{2(x-2)} = \frac{2 \cdot (2x+5) + 1 \cdot (4+3x)}{2(x-2)} = \\
 &= \frac{4x+10+4+3x}{2(x-2)} = \frac{7x+14}{2(x-2)}
 \end{aligned}$$

$$11) \quad \frac{2}{x} - \frac{3x+2}{x^2+2x} = \frac{2}{x} - \frac{3x+2}{x(x+2)} = \frac{2 \cdot (x+2) - 1 \cdot (3x+2)}{x(x+2)} = \frac{2x+4-3x-2}{x(x+2)} = \frac{-x+2}{x(x+2)}$$

$$\begin{aligned}
 12) \quad \frac{x+2}{6x} - \frac{x^2+1}{3x^2+3x} &= \frac{x+2}{6x} - \frac{x^2+1}{3x(x+1)} = \frac{(x+1)(x+2) - 2(x^2+1)}{6x(x+1)} = \\
 &= \frac{x^2+2x+x+2-2x^2-2}{6x(x+1)} = \frac{-x^2+3x}{6x(x+1)} = \frac{x(-x+3)}{6x(x+1)} = \frac{-x+3}{6(x+1)}
 \end{aligned}$$

$$13) \quad \frac{5-3x}{x^2-4x} - \frac{5}{3x-12} = \frac{5-3x}{x(x-4)} - \frac{5}{3(x-4)} = \frac{3(5-3x) - 5x}{3x(x-4)} = \frac{15-9x-5x}{3x(x-4)} = \frac{-14x+15}{3x(x-4)}$$

$$\begin{aligned}
 14) \quad \frac{3x+2}{9x^2+6x+1} - \frac{2-3x}{3x+1} &= \frac{3x+2}{(3x+1)^2} - \frac{2-3x}{3x+1} = \frac{1 \cdot (3x+2) - (3x+1)(2-3x)}{(3x+1)^2} = \\
 &= \frac{3x+2 - (6x-9x^2+2-3x)}{(3x+1)^2} = \frac{3x+2-6x+9x^2-2+3x}{(3x+1)^2} = \frac{9x^2}{(3x+1)^2}
 \end{aligned}$$

$$\begin{aligned}
 15) \quad \frac{3a+1}{5a-4} + \frac{4-3a}{25a^2-16} &= \frac{3a+1}{5a-4} + \frac{4-3a}{(5a+4)(5a-4)} = \frac{(5a+4)(3a+1) + 1(4-3a)}{(5a+4)(5a-4)} = \\
 &= \frac{15a^2+5a+12a+4+4-3a}{(5a+4)(5a-4)} = \frac{15a^2+14a+8}{(5a+4)(5a-4)}
 \end{aligned}$$

$$\begin{aligned}
 16) \quad \frac{4}{3a+2} + \frac{4-3a}{9a^2-4} &= \frac{4}{3a+2} + \frac{4-3a}{(3a+2)(3a-2)} = \frac{4(3a-2) + 1(4-3a)}{(3a+2)(3a-2)} = \frac{12a-8+4-3a}{(3a+2)(3a-2)} = \\
 &= \frac{9a-4}{(3a+2)(3a-2)}
 \end{aligned}$$

$$\begin{aligned}
 17) \quad \frac{3x-2}{x^2+6x+9} - \frac{2-x}{x+3} &= \frac{3x-2}{(x+3)^2} - \frac{2-x}{x+3} = \frac{1 \cdot (3x-2) - (x+3)(2-x)}{(x+3)^2} = \\
 &= \frac{3x-2 - (2x-x^2+6-3x)}{(x+3)^2} = \frac{3x-2-2x+x^2-6+3x}{(x+3)^2} = \frac{x^2+4x-8}{(x+3)^2}
 \end{aligned}$$