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

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

$=\dfrac{4x+10+4+3x}{2(x-2)}=\dfrac{7x+14}{2(x-2)}$

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

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

$=\dfrac{x^2+2x+x+2-2x^2-2}{6x(x+1)}=\dfrac{-x^2+3x}{6x(x+1)}=\dfrac{x(-x+3)}{6x(x+1)}=\dfrac{-x+3}{6(x+1)}$

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

14) $\dfrac{3x+2}{9x^2+6x+1}-\dfrac{2-3x}{3x+1}=\dfrac{3x+2}{(3x+1)^2}-\dfrac{2-3x}{3x+1}=\dfrac{1\cdot(3x+2)-(3x+1)(2-3x)}{(3x+1)^2}=$

$=\dfrac{3x+2-(6x-9x^2+2-3x)}{(3x+1)^2}=\dfrac{3x+2-6x+9x^2-2+3x}{(3x+1)^2}=\dfrac{9x^2}{(3x+1)^2}$

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

$=\dfrac{15a^2+5a+12a+4+4-3a}{(5a+4)(5a-4)}=\dfrac{15a^2+14a+8}{(5a+4)(5a-4)}$

16) $\dfrac{4}{3a+2}+\dfrac{4-3a}{9a^2-4}=\dfrac{4}{3a+2}+\dfrac{4-3a}{(3a+2)(3a-2)}=\dfrac{4(3a-2)+1(4-3a)}{(3a+2)(3a-2)}=\dfrac{12a-8+4-3a}{(3a+2)(3a-2)}=$

$=\dfrac{9a-4}{(3a+2)(3a-2)}$

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

$\dfrac{3x-2-(2x-x^2+6-3x)}{(x+3)^2}=\dfrac{3x-2-2x+x^2-6+3x}{(x+3)^2}=\dfrac{x^2+4x-8}{(x+3)^2}$