Násobení, dělení lomených výrazů, 2. část

1) $\dfrac{2xy}{x+2y} \cdot \dfrac{3x+6y}{6x} =$

2) $\dfrac{5x-3}{x+9} \cdot \dfrac{x^2+9x}{20x-12} =$

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

4) $\dfrac{x^2-y^2}{x^2+xy} \cdot \dfrac{xy}{(x-y)^2} =$

5) $\dfrac{2x-10}{x^2-4x+4} : \dfrac{x-5}{x-2} =$

6) $\dfrac{4x}{x^2+10x+25} : \dfrac{10-2x}{x^2-25} =$

7) $\dfrac{x^2-8x}{x^2-16x+64} : \dfrac{3x+24}{x^2-64} =$

8) $\dfrac{x^2-6x+9}{3y-12} : \dfrac{x^2-9}{y-4} =$

9) $\dfrac{\dfrac{6x}{15y^2}}{\dfrac{9x}{10x^2y}} =$

10) $\dfrac{\dfrac{5x^2}{3y}}{-10x} =$

11) $\dfrac{\dfrac{1-x}{x^2-1}}{1+x} =$

12) $\dfrac{\dfrac{(x-y)^2}{x^2-y^2}}{\dfrac{x-y}{x+y}} =$

Řešení

1) $\dfrac{2xy}{x+2y}\cdot\dfrac{3x+6y}{6x}=\dfrac{2xy}{x+2y}\cdot\dfrac{3(x+2y)}{6x}=\dfrac{6xy}{6x}=y$

2) $\dfrac{5x-3}{x+9}\cdot\dfrac{x^2+9x}{20x-12}=\dfrac{5x-3}{x+9}\cdot\dfrac{x(x+9)}{4(5x-3)}=\dfrac{x}{4}$

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

4) $\dfrac{x^2-y^2}{x^2+xy}\cdot\dfrac{xy}{(x-y)^2}=\dfrac{(x+y)(x-y)}{x(x+y)}\cdot\dfrac{xy}{(x-y)(x-y)}=\dfrac{xy}{x(x-y)}=\dfrac{y}{x-y}$

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

6) $\dfrac{4x}{x^2+10x+25}:\dfrac{10-2x}{x^2-25}=\dfrac{4x}{(x+5)(x+5)}\cdot\dfrac{(x+5)(x-5)}{2(5-x)}=\dfrac{2x(x-5)}{-(x+5)(-5+x)}=-\dfrac{2x}{x+5}$

7) $\dfrac{x^2-8x}{x^2-16x+64}:\dfrac{3x+24}{x^2-64}=\dfrac{x(x-8)}{(x-8)(x-8)}\cdot\dfrac{(x+8)(x-8)}{3(x+8)}=\dfrac{x}{3}$

8) $\dfrac{x^2-6x+9}{3y-12}:\dfrac{x^2-9}{y-4}=\dfrac{(x-3)(x-3)}{3(y-4)}\cdot\dfrac{y-4}{(x+3)(x-3)}=\dfrac{x-3}{3(x+3)}$

9) $\dfrac{\dfrac{6x}{15y^2}}{\dfrac{9x}{10x^2y}}=\dfrac{6x}{15y^2}:\dfrac{9x}{10x^2y}=\dfrac{6x}{15y^2}\cdot\dfrac{10x^2y}{9x}=\dfrac{2}{3y}\cdot\dfrac{2x^2}{3}=\dfrac{4x^2}{9y}$

10) $\dfrac{\dfrac{5x^2}{3y}}{-10x}=\dfrac{5x^2}{3y}:\dfrac{-10x}{1}=\dfrac{5x^2}{3y}\cdot\dfrac{1}{-10x}=\dfrac{x^2}{3y}\cdot\dfrac{1}{-2x}=-\dfrac{x}{6y}$

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

12) $\dfrac{\dfrac{(x-y)^2}{x^2-y^2}}{\dfrac{x-y}{x+y}}=\dfrac{(x-y)^2}{x^2-y^2}:\dfrac{x-y}{x+y}=\dfrac{(x-y)(x-y)}{(x+y)(x-y)}\cdot\dfrac{x+y}{x-y}=1$