

DĚLENÍ LOMENÝCH VÝRAZŮ

Př1 a) $(3a - \frac{4x^2}{3a}) : (1 + \frac{2x}{3a}) = \frac{(3a)^2 - 4x^2}{3a} : \frac{3a + 2x}{3a} =$

$$= \frac{9a^2 - 4x^2}{3a} \cdot \frac{3a}{3a + 2x} = \frac{(3a - 2x)(3a + 2x)}{3a + 2x} = \underline{\underline{3a - 2x}}$$

$a \neq 0 \quad 3a \neq -2x$
 $a \neq -\frac{2x}{3}$

b) $(x + \frac{y-x}{1+xy}) : (1 + \frac{x(x-y)}{1+xy}) = \frac{x(1+xy) + (y-x)}{1+xy} : \frac{1+xy + x(x-y)}{1+xy} =$

$$= \frac{x + x^2y + y - x}{1+xy} \cdot \frac{1+xy}{1+xy + x^2 - xy} = \frac{x^2y + y}{1+x^2} = \frac{y(x^2+1)}{1+x^2} = \underline{\underline{y}}$$

$xy \neq -1$

c) $\frac{x^2-y^2}{9x^2y^2} : \frac{y-x}{3xy} = \frac{(x-y)(x+y)}{9x^2y^2} \cdot \frac{3xy}{y-x} = \frac{-(x+y)}{3xy}$ $x \neq 0$
 $y \neq 0$
 $x \neq y$

d) $\frac{3x-3y}{4ax+4ay} : \frac{ay-ax}{4x^2-4y^2} = \frac{3(x-y)}{4a(x+y)} \cdot \frac{4(x^2-y^2)}{a(y-x)} = \frac{-3(x-y)(x+y)}{a(x+y) \cdot a} =$

$$= \frac{-3(x-y)}{a^2} = \frac{3(y-x)}{a^2}$$
 $a \neq 0$
 $x \neq y$
 $x \neq -y$

e) $[\left(\frac{2}{x+1}\right)^2 - \frac{1}{x+1}] : \frac{1}{x+1} = \left[\frac{4}{(x+1)^2} - \frac{1}{x+1}\right] \cdot \frac{x+1}{1} =$

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

Př2 a) $\frac{\frac{1}{1-y} - 1}{1 - \frac{1-2y^2}{1-y} + y} = \frac{\frac{1 - (1-y)}{1-y}}{\frac{1-y - (1-2y^2) + y(1-y)}{1-y}} = \frac{\frac{1-1+y}{1-y}}{\frac{1-y-1+2y^2+y-y^2}{1-y}} =$

$$= \frac{y}{1-y} : \frac{y^2}{1-y} = \frac{y}{1-y} \cdot \frac{1-y}{y^2} = \underline{\underline{\frac{1}{y}}}$$

$y \neq 1$
 $y \neq 0$

$$\begin{aligned}
 \text{b) } \frac{\frac{2\Delta+1}{2\Delta-1} - \frac{2\Delta-1}{2\Delta+1}}{\frac{4\Delta}{10\Delta-5}} &= \frac{\frac{(2\Delta+1)^2 - (2\Delta-1)^2}{(2\Delta-1)(2\Delta+1)}}{\frac{4\Delta}{5(2\Delta-1)}} = \\
 &= \frac{4\Delta^2 + 4\Delta + 1 - (4\Delta^2 - 4\Delta + 1)}{(2\Delta-1) \cdot (2\Delta+1)} : \frac{4\Delta}{5(2\Delta-1)} = \frac{\Delta + \frac{1}{2}}{\Delta \neq 0} \\
 &= \frac{4\Delta^2 + 4\Delta + 1 - 4\Delta^2 + 4\Delta - 1}{(2\Delta-1)(2\Delta+1)} \cdot \frac{5(2\Delta-1)}{4\Delta} = \frac{8\Delta}{2\Delta+1} \cdot \frac{5}{4\Delta} = \underline{\underline{\frac{10}{2\Delta+1}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{c) } 2 + \frac{1}{3 - \frac{1}{x-2}} &= 2 + \frac{1}{\frac{3(x-2)-1}{x-2}} = 2 + 1 : \frac{3x-6-1}{x-2} = \\
 &= 2 + 1 \cdot \frac{x-2}{3x-7} = 2 + \frac{x-2}{3x-7} = \frac{2(3x-7) + (x-2)}{3x-7} = \\
 &= \frac{6x-14+x-2}{3x-7} = \underline{\underline{\frac{7x-16}{3x-7}}} \quad x \neq \frac{7}{3} \quad x \neq 2
 \end{aligned}$$

$$\begin{aligned}
 \text{d) } \frac{\frac{b+1}{b-1}}{\frac{b^2-1}{2b^2-4b+2}} &= \frac{\frac{b+1}{b-1}}{\frac{(b-1)(b+1)}{2(b^2-2b+1)}} = \frac{b+1}{b-1} : \frac{(b-1)(b+1)}{2(b-1)^2} = \\
 &= \frac{b+1}{b-1} \cdot \frac{2(b-1)^2}{(b-1)(b+1)} = \underline{\underline{2}} \quad b \neq \pm 1
 \end{aligned}$$

$$\boxed{\text{Pr 3}} \quad \frac{p-q}{p+q} : \frac{q-p}{q+p} = \frac{p-q}{p+q} \cdot \frac{q+p}{q-p} = \underline{\underline{(-1)}} \quad p \neq \pm q$$

$$\boxed{\text{Pr 4}} \quad \frac{3r}{2r-1} : \frac{2r}{r-2} = \frac{3r}{2r-1} \cdot \frac{r-2}{2r} = \underline{\underline{\frac{3(r-2)}{2(2r-1)}}} \quad r \neq 0, r \neq \frac{1}{2}, r \neq 2$$

$$\begin{aligned}
 \boxed{\text{Pr 5}} \quad \frac{am^2 - an^2}{m^2 + 2mn + n^2} : \frac{am^2 - 2amn + an^2}{3m + 3n} &= \frac{a(m^2 - n^2)}{(m+n)^2} \cdot \frac{3(m+n)}{a(m^2 - 2mn + n^2)} = \\
 &= \frac{(m-n)(m+n)}{m+n} \cdot \frac{3}{(m-n)^2} = \underline{\underline{\frac{3}{m-n}}} \quad m \neq \pm n \quad a \neq 0
 \end{aligned}$$