1

M9

... a jdeme dál ...

Násobení lomených výrazů

zhruba 12.11.–13.11.

Str. sb.

42/6

a) $\frac{\cancel{x-5}}{\cancel{2x}_{1}}\cdot\frac{\cancel{6x}^{3}}{\cancel{x-5}} = \frac{3}{1} = 3$ $\quad x\neq 0$, $x\neq 5$

ověř pro $x=2$ uděláme jen pro a)

$$\frac{x-5}{2x}\cdot\frac{6x}{x-5} = \frac{2-5}{2\cdot 2}\cdot\frac{6\cdot 2}{2-5} = -\frac{\cancel{3}^{1}}{\cancel{4}_{1}}\cdot\frac{\cancel{12}^{3}}{-\cancel{3}_{1}} = 3$$

b) $\frac{\cancel{2x+3}}{x}\cdot\frac{x^2}{\cancel{3+2x}} = \frac{x^2}{x} = \frac{x}{1} = x$ $\quad x\neq 0$, $x\neq -\frac{3}{2}$

c) $-\frac{\cancel{3x-1}}{2x}\cdot\frac{3x^2}{\cancel{-1+3x}} = -\frac{3x^2}{2x} = -\frac{3x}{2}$ $\quad x\neq 0$, $x\neq \frac{1}{3}$

„kosmeták"

d) $\frac{9x^3}{15x-12}\cdot\frac{5x-4}{6x^2} = \frac{\cancel{9}^{3}x^3}{\cancel{3}_{1}\cdot\cancel{(5x-4)}}\cdot\frac{\cancel{5x-4}}{6x^2} =$

... musíme vytknout A PAK AŽ KRÁTIT!

$= \frac{\cancel{3}^{1}\cdot x^3}{\cancel{6}_{2}x^2} = \frac{x^3}{2x^2} = \frac{x}{2}$ $\quad x\neq 0$, $x\neq \frac{4}{5}$

... můžeme zkrátit vše najednou, já ale zatím raději krátím hezky postupně ...

e) $\frac{x+1}{2x-3}\cdot\frac{21-14x}{1+x} = -\frac{\cancel{x+1}}{\cancel{-2x+3}}\cdot\frac{7\cdot\cancel{(3-2x)}}{\cancel{1+x}} = -7$

„kosmeták"

$x\neq -1$

$x\neq \frac{3}{2}$

f) $\dfrac{4r-10}{r+3} \cdot \dfrac{12+4r}{15-6r} = -\dfrac{2\cdot(\cancel{2r-5})}{\cancel{r+3}} \cdot \dfrac{4\cdot(\cancel{3+r})}{3\cdot(\cancel{-5+2r})} =$

„kosmeták"

$= -\dfrac{8}{3}$ $\qquad r \neq -3$, $\; r \neq \dfrac{5}{2}$

43/7

a) $\dfrac{s+2}{s^2-4} \cdot \dfrac{s-2}{3s} = \dfrac{\cancel{s+2}}{(\cancel{s+2})\cdot(\cancel{s-2})} \cdot \dfrac{\cancel{s-2}}{3s} = \dfrac{1}{3s}$ $\qquad s \neq 0$, $\; s \neq 2$, $\; s \neq -2$

b) $\dfrac{s+2}{s^2-1} \cdot \dfrac{(s+1)^2}{2+s} = \dfrac{\cancel{s+2}}{(\cancel{s+1})\cdot(s-1)} \cdot \dfrac{(s+1)^{\cancel{2}}}{\cancel{2+s}} = \dfrac{s+1}{s-1}$ $\qquad s \neq 1$, $\; s \neq -1$, $\; s \neq -2$

c) $\dfrac{s^2-9}{s+9} \cdot \dfrac{27+3s}{3-s} = -\dfrac{(s+3)\cdot(\cancel{s-3})}{\cancel{s+9}} \cdot \dfrac{3\cdot(\cancel{9+s})}{\cancel{-3+s}} = -3\cdot(s+3)$

„kosmeták"

$s \neq -9$, $\; s \neq 3$

d) $\dfrac{(s+6)^2}{36-s^2} \cdot \dfrac{5s-30}{7s+42} = -\dfrac{(\cancel{s+6})^{\cancel{2}}}{(\cancel{-6+s})\cdot(\cancel{6+s})} \cdot \dfrac{5\cdot(\cancel{s-6})}{7\cdot(\cancel{s+6})} = -\dfrac{5}{7}$

„kosmeták"

$s \neq -6$, $\; s \neq 6$

e) $\dfrac{2s^2-50}{(s+5)^2} \cdot \dfrac{15+3s}{5-s} = \dfrac{2\cdot(s^2-25)}{(s+5)^2} \cdot \dfrac{3\cdot(5+s)}{5-s} =$

$= -\dfrac{2\cdot(\cancel{s+5})\cdot(\cancel{s-5})}{(\cancel{s+5})^{\cancel{2}}} \cdot \dfrac{3\cdot(\cancel{5+s})}{\cancel{-5+s}} = -6$ $\qquad s \neq 5$, $\; s \neq -5$

„kosmeták"

f) $\dfrac{(s+2)^2}{s^2-4} \cdot \dfrac{6-3s}{10+2s} = -\dfrac{(s+2)^{\cancel{2}}}{(\cancel{-s+2})\cdot(\cancel{s+2})} \cdot \dfrac{3\cdot(\cancel{2-s})}{2\cdot(5+s)} = \dfrac{-3\cdot(s+2)}{2\cdot(5+s)}$

„kosmeták"

$s \neq 2$, $\; s \neq -5$, $\; s \neq -2$

43/8

a) $\frac{rs+s}{4r} \cdot \frac{-2rs}{r+1} = \frac{s\cdot\cancel{(r+1)}}{\cancel{4r}_{2}} \cdot \frac{-\cancel{2r}^{1}s}{\cancel{r+1}} = -\frac{s^2}{2}$ $\quad r \neq 0$, $r \neq -1$

b) $\frac{r^2}{rs+s^2} \cdot \frac{s+r}{rs} = \frac{r^2}{s\cdot\cancel{(r+s)}} \cdot \frac{\cancel{s+r}}{rs} = \frac{r}{s^2}$ $\quad r \neq 0$, $s \neq 0$, $r \neq -s$

c) $\frac{r^2-rs}{r^2s} \cdot \frac{3rs^2}{s-r} = -\frac{r\cdot\cancel{(r-s)}}{r^2s} \cdot \frac{3rs^2}{\cancel{-s+r}} = -3s$ $\quad r \neq 0$, $s \neq 0$, $s \neq r$

„kosmeták"

d) $\frac{rs-5s^2}{5s-r} \cdot \frac{2r+6s}{3s+r} = -\frac{s\cdot\cancel{(r-5s)}}{\cancel{-5s+r}} \cdot \frac{2\cdot\cancel{(r+3s)}}{\cancel{3s+r}} = -2s$ $\quad r \neq 5s$, $r \neq -3s$

„kosmeták"

43/9

a) $\frac{u^2-v^2}{u+2v} \cdot \frac{4v+2u}{u+v} = \frac{\cancel{(u+v)}\cdot(u-v)}{\cancel{u+2v}} \cdot \frac{2\cdot\cancel{(2v+u)}}{\cancel{u+v}} = 2\cdot(u-v)$

$u \neq -v$, $u \neq -2v$

b) $\frac{(u-v)^2}{u} \cdot \frac{u^2+uv}{u^2-v^2} = \frac{(u-v)^{\cancel{2}}}{\cancel{u}} \cdot \frac{\cancel{u}\cdot\cancel{(u+v)}}{\cancel{(u+v)}\cdot\cancel{(u-v)}} =$

$= u-v$ $\quad u \neq 0$, $u \neq v$, $u \neq -v$

c) $\frac{u^2-v^2}{(u+v)^2} \cdot \frac{2u}{v-u} = -\frac{\cancel{(u+v)}\cdot\cancel{(u-v)}}{(u+v)^{\cancel{2}}} \cdot \frac{2u}{\cancel{-v+u}} = \frac{-2u}{u+v}$

„kosmeták"

$u \neq -v$, $u \neq v$

d) $\frac{u^2-4v^2}{2v+u} \cdot \frac{-3v}{2v-u} = -\frac{\cancel{(u-2v)}\cdot\cancel{(u+2v)}}{\cancel{2v+u}} \cdot \frac{-3v}{\cancel{-2v+u}} =$

$= -(-3v) = 3v$ $\quad u \neq 2v$, $u \neq -2v$

e) $\dfrac{(u+v)^3}{u^2-v^2} \cdot \dfrac{v-u}{u^2+uv} = -\dfrac{(u+v)^{\cancel{3}}}{\cancel{(-u}+v)\cdot(\cancel{u+v})} \cdot \dfrac{\cancel{v}-u}{u\cdot(\cancel{u+v})} =$

„kozutak" -1

$= -\dfrac{(u+v)}{u}$

$u \neq v$
$u \neq -v$
$u \neq 0$

f) $\dfrac{(u-v)^3}{uv-u^2} \cdot \dfrac{v^2+uv}{u^2-v^2} = -\dfrac{(u-v)^{\cancel{3}}}{u\cdot(-\cancel{v+u})} \cdot \dfrac{v\cdot(\cancel{v+u})}{(\cancel{u+v})\cdot(\cancel{u-v})} =$

„kozutak" -1

$= -\dfrac{(u-v)\cdot v}{u}$

$u \neq v$
$u \neq -v$
$u \neq 0$