

Plus!  
ZSS

1. číselními  
proce  
B

15. 11. 2006

1. a)  $\frac{(x-y)^2}{2x-1} \cdot \frac{2x-1 \neq 0}{2x+1} \cdot \frac{1}{x+\frac{1}{2}}$  by  $\frac{u}{u(x-1)}$   $u \neq 0$   $1 \neq 1$

1\*

číslicí

2. a)  $\frac{x-2}{5x-10} = \frac{x-2}{5(x-2)} = \frac{1}{5}$   $5x-10 \neq 0$   $5x \neq 10$   $1:5$   $x \neq 2$

b)  $\frac{4x^2+4x}{2xy+2x} = \frac{4x(x+1)}{2x(y+1)} = \frac{2x(x+1)}{y+1}$   $x \neq 0$   $y \neq -1$

c)  $\frac{n^2-4}{n+2} = \frac{(n-2)(n+2)}{n+2} = n-2$   $n \neq -2$

3. a)  $\frac{n}{n+5} \cdot \frac{n^2+n^2}{n-5} = \frac{n}{n+5} \cdot \frac{n(n+5)}{n-5} = \frac{n^2}{n-5}$   $n \neq -5$   $n \neq 5$

10

b)  $\frac{e^2-1}{e^2+2e+1} \cdot \frac{3e+3}{4e-4} = \frac{(e+1)(e-1)}{(e+1)^2} \cdot \frac{3(e+1)}{4(e-1)} = \frac{3(e+1)}{4(e+1)} = \frac{3}{4}$   $e \neq -1$   $e \neq 1$

4. a)  $\frac{3}{m+n} + \frac{2}{m-n} = \frac{3(m-n)+2(m+n)}{(m+n)(m-n)} = \frac{3m-3n+2m+2n}{m^2-n^2} = \frac{5m-n}{m^2-n^2}$   $m \neq -n$   $m \neq n$

44

15

b)  $\frac{x}{x+y} - \frac{y}{3x+3y} = \frac{x}{x+y} - \frac{y}{3(x+y)} = \frac{3x-y}{3(x+y)}$   $x \neq -y$

c)  $\frac{2-a}{a^2-9} + \frac{2+a}{(a+3)^2} = \frac{2-a}{(a+3)(a-3)} + \frac{2+a}{(a-3)^2} = \frac{2-a}{(a^2-9)^2}$

$$c) \frac{2-a}{a^2-9} + \frac{2+a}{(a-3)^2} = \frac{2-a}{(a+3)(a-3)} + \frac{2+a}{(a-3)^2} = \frac{(2-a)(a-3) + (2+a)(a+3)}{(a+3)(a-3)^2} = 7$$

$$= \frac{2a-6-a^2+3a+2a+6+a^2+3a}{(a+3)(a-3)^2} = \frac{10a}{(a+3)(a-3)^2} \quad a \neq -3$$

5. a)  $\frac{x+1}{x-2} = \frac{5}{2} \quad | \cdot 2(x-2)$

$$2(x+1) = 5(x-2)$$

$$2x+2 = 5x-10 \quad | -2x$$

$$2 = 3x-10 \quad | +10$$

$$12 = 3x \quad | :3$$

$$x = 4$$

$x \neq 2$  ✓

$L = \frac{4+1}{4-2} = \frac{5}{2}$

$P = \frac{5}{2}$

$L = P$

$(a+3)(a-3)^2 = (a^2-9)(a-3)$

Alle  $(a^2-9)^2 = a^4 - 2a^2 \cdot 9 + 81$

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

$$(x-4) - (x-2) = 2(x+4)$$

$$x-4-x+2 = 2x+8$$

$$-2 = 2x+8 \quad | -8$$

$$-10 = 2x \quad | :2$$

$$-5 = x$$

$x \neq 2$  ✓

$x \neq 4$  ✓

$L = P$

$2A \cdot L = \frac{1}{3-2} - \frac{1}{3-4} = \frac{1}{1} - \frac{1}{-1} = \frac{1}{1} + \frac{1}{1} = \frac{2}{1} = 2$

$A = \frac{2}{3-2} = \frac{2}{1} = 2$

$L = P$

c)  $\frac{v+1}{v+6} - \frac{v+3}{v-6} \quad | \cdot (v+6)(v-6)$

$$(v+1)(v-6) = (v+3)(v+6)$$

$$v^2+v-6v-6 = v^2+3v+6v+18 \quad | -v^2$$

$$-5v-6 = 9v+18 \quad | -9v$$

$$-14v-6 = 18 \quad | +6$$

$$-14v = 24$$

$$v = \frac{-24}{14} = \frac{-12}{7}$$

$v \neq -6$  ✓

$v \neq 6$  ✓

I. číselnými práce

(A)

15. 11. 2006

① a)  $\frac{n^2-4}{n+2} \mid n \neq -2$   
 b)  $\frac{3c+4}{c(c+5)} \mid c \neq 0; c+5 \neq 0 \quad c \neq -5$

② a)  $\frac{5m+10m}{3m+6m} = \frac{5(m+2m)}{3(m+2m)} = \frac{5}{3} \mid m+2m \neq 0 \quad m \neq -2m$

b)  $\frac{ab-4b^2}{a^2-4ab} = \frac{b(a-4b)}{a(a-4a)} = \frac{1}{a} \mid a \neq 0; a-4a \neq 0 \quad a \neq 4b$

c)  $\frac{u+3}{u^2-9} = \frac{(u+3)}{(u+3)(u-3)} = \frac{1}{u-3} \mid u \neq \pm 3$

③ a)  $\frac{a-b}{3b} \cdot \frac{3a}{2a-2b} = \frac{a-b}{3b} \cdot \frac{3a}{2(a-b)} = \frac{a}{2b(a-b)} \mid b \neq 0; a-b \neq 0 \quad a \neq b$

b)  $\frac{2x^2+8x+8}{x-2} \cdot \frac{x^2-4}{4(x+2)} = \frac{2(x^2+4x+4)}{x-2} \cdot \frac{(x-2)(x+2)}{4(x+2)} = \frac{2(x+2)^2}{x-2} \cdot \frac{(x-2)(x+2)}{4(x+2)}$   
 $= \frac{(x+2)(x+2)}{2} \mid x \neq 0; x \neq \pm 2$

④ a)  $\frac{p}{q-2} - \frac{p}{q+2} = \frac{p(q+2) - p(q-2)}{q^2-4} = \frac{pq+2p - pq+2p}{q^2-4} = \frac{4p}{q^2-4}$

podmínky

$q \neq \pm 2$

b)  $\frac{m-n}{m-n} + \frac{m}{m} = \frac{2m+(m-n)}{m(m-n)} = \frac{m+m}{m(m-n)} \mid m \neq 0; m-n \neq 0 \quad m \neq n$

c)  $\frac{3+a}{a^2-4} + \frac{3-a}{(a-2)^2} = \frac{3+a}{(a+2)(a-2)} + \frac{3-a}{(a-2)^2} \mid a^2-4 \neq 0 \quad a \neq 2; a-2 \neq 0, a \neq -2$

⑤ a)  $\frac{4t-3}{5-6t} + \frac{1}{2} = 0 \mid 2(5-6t) \mid t \neq 0$

$2(4t-3) + (5-6t) = 0$

$8t-6+5-6t=0$

$2t-1=0 \quad | +1$

$2t=1 \quad | :2$

$t = \frac{1}{2}$

27  
1



3

3

7

2

9

6

4

14

14

4

$$b) \frac{1}{x-1} - \frac{1}{x+3} = \frac{1}{x^2-1} \quad | (x^2-1)(x+3) \quad | x \neq \pm 1; x \neq -3$$

$$1(x+1)(x+3) - 1(x^2-1) = (x+5)$$

$$x^2 + 3x + 1x + 3 - x^2 + 1 = x + 5$$

$$4x + 4 = x + 5 \quad | -x$$

$$3x + 4 = 5 \quad | -4$$

$$3x = 1 \quad | :3$$

$$x = \frac{1}{3}$$

$$c) \frac{z+2}{z-2} = \frac{z-1}{z+1} \quad | (z-2)(z+1) \quad | z \neq \pm 2; z \neq -1$$

$$(z+2)(z+1) = (z-1)(z-2)$$

$$z^2 + 3z + 2 = z^2 - 2z + 2 \quad | -z^2$$

$$3z + 2 = -2z + 2 \quad | +3z$$

$$6z + 2 = 2 \quad | -2$$

$$6z = 0$$

$$z = 0$$

$$d) c) \frac{3+a}{a^2-4} + \frac{3-a}{(a-2)^2} = \frac{(a-2)^2(3+a) + a^2-4(3-a)}{(a+2)(a-2)^2(a-2)^2} = \frac{(a^2-4a+4)(3+a) + (a^2-4)(3-a)}{(a+2)(a-2)^2(a-2)^2}$$

$$= \frac{3a^2 + a^3 - 12a - 4a^2 + 12 + 4a + 3a^2 - a^3 - 12 + 4a}{(a+2)(a-2)^2(a-2)^2}$$

$$= \frac{2a^2 - 4a}{(a^2-4)(a-2)^2} = \frac{2a(a-2)}{(a^2-4)(a-2)^2}$$

~~La nördliche ist nicht 6/2~~

$$\underline{\underline{\frac{2a}{(a^2-4)(a-2)}}}$$