NÁSOBENIE A DELENIE LOMENÝCH VÝRAZOV
(riešené úlohy)

1. Vynásob lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{a^3}{b} \cdot \dfrac{c^4}{a^2} = \dfrac{a}{b} \cdot \dfrac{c^4}{1} = \dfrac{a.c^4}{b}$ P1: b≠0   P2: a≠0

Pomôcka: $\dfrac{8}{12} \cdot \dfrac{16}{4} = \dfrac{128:4}{48:4} = \dfrac{32:4}{12:4} = \dfrac{8}{3}$ (základný tvar)

$\dfrac{8}{12} \cdot \dfrac{16}{4} = \dfrac{2}{3} \cdot \dfrac{4}{1} = \dfrac{8}{3}$ **(najprv krátiť až potom násobiť!!!)**

b) $\dfrac{p}{6q^2} \cdot \left(-4q^3\right) = \dfrac{p}{6q^2:q^2} \cdot \dfrac{\left(-4q^3\right):q^2}{1} = \dfrac{p}{6} \cdot \dfrac{(-4q)}{1} = \dfrac{-2pq}{3} = -\dfrac{2pq}{3}$ P: q≠0

c) $\left(-\dfrac{4u^2}{21v^3}\right) \cdot \left(-\dfrac{7v}{8u^2}\right) = \left(-\dfrac{1.1}{3.v^2}\right) \cdot \left(-\dfrac{1.1}{2.1}\right) = +\dfrac{1}{6.v^2}$ P1: v≠0 P2: u≠0

d) $\dfrac{m}{3} \cdot \dfrac{n^2}{2m} \cdot \dfrac{10}{n} =$ **(D.d.ú.)**

e) $\dfrac{x}{y^2} \cdot \dfrac{y}{3x^2} \cdot (-x) =$ **(D.d.ú.)**

f) $\dfrac{3ab}{4xy} \cdot \dfrac{10x^2 y}{21ab^2} =$

g) $\dfrac{3x}{5ab} \cdot \dfrac{3ay}{4bz} \cdot \dfrac{4z}{9xy} =$

2. Vynásob lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{x^2 y}{3(x+1)} \cdot \dfrac{2(x+1)}{xy^2} = \dfrac{x.1}{3} \cdot \dfrac{2}{1.y} = \dfrac{2x}{3y}$ **P1: x≠-1 P2: x≠0 P3: y≠0**

b) $\dfrac{2m}{5m+5} \cdot \dfrac{5}{7m} = \dfrac{2m}{5(m+1)} \cdot \dfrac{5}{7m} = \dfrac{2.1}{1.(m+1)} \cdot \dfrac{1}{7.1} = \dfrac{2}{7.(m+1)}$ **P1: m≠0 P2: m≠–1**

c) $\dfrac{q-2}{p+q} \cdot \dfrac{2p+2q}{3q-6} = \dfrac{q-2}{p+q} \cdot \dfrac{2(p+q)}{3(q-2)} = \dfrac{2}{3}$ **P1: p+q≠0   => p≠-q**

P2: 3(q-2) ≠0 => q-2≠0 => q≠2

d) $\dfrac{r}{r+s} \cdot \dfrac{r^2+rs}{r-s} =$ **(D.d.ú.)**

e) $\dfrac{a^2+ab}{a} \cdot \dfrac{b}{ab+b^2} =$ **(D.d.ú.)**

f) $\dfrac{2x+8}{x^2} \cdot \dfrac{x^2-xy}{x+4} =$

g) $\dfrac{15+15n}{n^2-1} \cdot \dfrac{n^2-n}{3n-3} =$

3. Vydeľ lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{x(a+b)}{12a} : \dfrac{x^2}{a} = \dfrac{x(a+b)}{12a} \cdot \dfrac{a}{x^2} = \dfrac{(a+b)}{12} \cdot \dfrac{1}{x} = \dfrac{(a+b)}{12x}$ P1: <u>a≠0</u>   P2: <u>x≠0</u>

b) $\dfrac{2c-2}{d^2} : \dfrac{c-1}{d} = \dfrac{2(c-1)}{d^2} \cdot \dfrac{d}{c-1} = \dfrac{2.1}{d} \cdot \dfrac{1}{1} = \dfrac{2}{d}$ P1: <u>d≠0</u>   P2: <u>c≠1</u>

c) $\dfrac{t^2-2t}{3} : \dfrac{t}{6} = \dfrac{t(t-2)}{3} \cdot \dfrac{6}{t} = \dfrac{1(t-2)}{1} \cdot \dfrac{2}{1} = 2(t-2)$ P: <u>t≠0</u>

d) $\dfrac{3r}{s+5} : \dfrac{r}{s-2} = \dfrac{3r}{s+5} \cdot \dfrac{s-2}{r} = \dfrac{3.1}{s+5} \cdot \dfrac{s-2}{1} = \dfrac{3(s-2)}{s+5}$ P1: <u>r≠0</u>   P2: <u>s≠2</u>   P3: <u>s≠−5</u>

e) $\dfrac{x^2-xy}{y} : \dfrac{x-y}{xy} = \dfrac{x(x-y)}{y} \cdot \dfrac{x.y}{(x-y)} = \dfrac{x}{1} \cdot \dfrac{x}{1} = x^2$ P1: <u>y≠0</u>   P2: <u>x≠0</u>   P3: <u>x≠y</u>

h) $\dfrac{a+b}{a-b} : \dfrac{b+a}{b-a}$ **(D.d.ú.)**

f) $\dfrac{b-2}{a+b} : \dfrac{3b-6}{2a+2b}$ **(D.d.ú.)**

4. Vynásob lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{a^2-b^2}{a+b} \cdot \dfrac{ab}{a-b} =$

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

c) $\dfrac{5c-5d}{4c+4d} \cdot \dfrac{12c+12d}{20c-20d} =$

d) $\dfrac{z^2+z}{4z-12} \cdot \dfrac{4z}{z+1} =$

e) $\dfrac{(r+1)^2}{r-1} \cdot \dfrac{(r-1)^2}{r+1} =$

f) $\dfrac{2a^2-2b^2}{3x^2-3y^2} \cdot \dfrac{9(x+y)}{4a-4b} =$

g) $\dfrac{a^2-ab}{ab+b^2} \cdot \dfrac{a^2+ab}{ab-b^2} =$

5. Vynásob lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{5-5x}{1+x} \cdot \dfrac{3+3x}{10-10x} =$

b) $\dfrac{2a^2}{a^2b + ab^2} \cdot \dfrac{ab + b^2}{2a - 4} =$

c) $\dfrac{r^2 - 9}{r + 1} \cdot \dfrac{r^2 - 1}{r - 3} =$

d) $\dfrac{m^2 - mn}{m^2 + mn} \cdot \dfrac{m^2n + mn^2}{mn} =$

e) $\dfrac{4u - 4v}{2uv} \cdot \dfrac{u^2}{u^2 - uv} =$

f) $\dfrac{p^2 + pq}{5p^2 - 5q^2} \cdot \dfrac{p^2q - q^2}{2p^2 - 2p} =$

6. Vynásob lomené výrazy tak, aby výsledok bol v základnom tvare:

a) $\dfrac{a^2 - n^2}{(a + n)^2} \cdot \dfrac{4a + 4n}{5(a - n)} =$

b) $\dfrac{a^2 - 4}{1 - a} \cdot \dfrac{2b}{a - 2} \cdot \dfrac{1 - a^2}{ab + 2b} =$

c) $\dfrac{ax^2 - ay^2}{(a + b)^2} \cdot \dfrac{3a + 3b}{ax^2 - 2axy + ay^2} =$

d) $\dfrac{2x^2 + 8x + 8}{x - 2} \cdot \dfrac{x^2 - 4}{4(x + 2)} =$

e) $\dfrac{z^2 - 1}{z^2 + 2z + 1} \cdot \dfrac{3z + 3}{4z - 4} =$

f) $\dfrac{a^2 - 4b^2}{a^3 - a^2b} \cdot \dfrac{a - b}{a^2 + 2ab} =$