ALGEBERSKI ULOMKI

12. $\frac{a+5+6a^{-1}}{a+3-28a^{-1}} : \frac{1+a-2a^{-1}}{a-49a^{-1}} : \frac{1-5a^{-1}-14a^{-2}}{1-5a^{-1}+4a^{-2}} =$

$= \frac{a+5+6\cdot\frac{1}{a}}{a+3-28\cdot\frac{1}{a}} : \frac{1+a-2\cdot\frac{1}{a}}{a-49\cdot\frac{1}{a}} : \frac{1-5\cdot\frac{1}{a}-14\cdot\frac{1}{a^2}}{1-5\cdot\frac{1}{a}+4\cdot\frac{1}{a^2}} =$

$= \frac{a+5+\frac{6}{a}}{a+3-\frac{28}{a}} : \frac{1+a-\frac{2}{a}}{a-\frac{49}{a}} : \frac{1-\frac{5}{a}-\frac{14}{a^2}}{1-\frac{5}{a}+\frac{4}{a^2}} =$

$= \frac{\frac{a^2}{a}+\frac{5a}{a}+\frac{6}{a}}{\frac{a^2}{a}+\frac{3a}{a}-\frac{28}{a}} : \frac{\frac{1a}{a}+\frac{a^2}{a}-\frac{2}{a}}{\frac{a^2}{a}-\frac{49}{a}} : \frac{\frac{1a^2}{a^2}-\frac{5a}{a^2}-\frac{14}{a^2}}{\frac{1a^2}{a^2}-\frac{5a}{a^2}+\frac{4}{a^2}} =$

$= \frac{\frac{a^2+5a+6}{a}}{\frac{a^2+3a-28}{a}} : \frac{\frac{a+a^2-2}{a}}{\frac{a^2-49}{a}} : \frac{\frac{a^2-5a-14}{a^2}}{\frac{a^2-5a+4}{a^2}} =$

$= \frac{a^3+5a^2+6a}{a^3+3a^2-28a} : \frac{a^2+a^3-2a}{a^3-49a} : \frac{a^4-5a^3-14a^2}{a^4-5a^3+4a^2} =$

$= \frac{a(a^2+5a+6)}{a(a^2+3a-28)} : \frac{a(a+a^2-2)}{a(a^2-49)} : \frac{a^2(a^2-5a-14)}{a^2(a^2-5a+4)} =$

$= \frac{a(a+3)(a+2)}{a(a-4)(a+7)} : \frac{a(a+1)(a+2)}{a(a-7)(a+7)} : \frac{a^2(a-7)(a+2)}{a^2(a-4)(a+1)} =$

$= \frac{\cancel{a}(a+3)(a+2)}{\cancel{a}(a-4)(a+7)} \cdot \frac{a(a-7)(a+7)}{\cancel{a}(a+1)(a+2)} : \frac{a^2(a-7)(a+2)}{a^2(a-4)(a+1)} =$

$= \frac{(a+3)(a-7)}{(a-4)(a+1)} \cdot \frac{a^2\cancel{(a-4)}\cancel{(a+1)}}{a^2\cancel{(a-7)}\cancel{(a+2)}} =$

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

13. $\left(\frac{a-1}{a+2}\cdot\frac{a+4}{a-3}-\frac{a-3}{a+4}\cdot\frac{a}{a+1}\right):\frac{a^2+5a+4}{2a+1}=$

$=\left(\frac{a^2+4a-1a-4}{(a+2)(a+4)}-\frac{a^2+2a-3a-6}{(a+2)(a+4)}\right)\cdot\frac{(a+4)(a+1)}{2a+1}=$

$=\frac{a^2+4a-1a-4-a^2-2a+3a+6}{(a+2)(a+4)}\cdot\frac{(a+4)(a+1)}{2a+1}=$

$=\frac{4a+2}{(a+2)(a+4)}\cdot\frac{(a+4)(a+1)}{2a+1}=\frac{2(2a+1)}{(a+2)(a+4)}\cdot\frac{(a+4)(a+1)}{2a+1}=\frac{2(a+1)}{(a+2)}=\frac{2a+2}{a+2}$

14. $\left(\frac{a+1}{a-2}\cdot\frac{a-4}{a-4}-\frac{a+3}{a-4}\cdot\frac{a}{a-1}\right):\frac{2a-1}{a^2-5a+4}=$

$=\left(\frac{a^2-4a+1a-4}{(a-2)(a-4)}-\frac{a^2-2a+3a-6}{(a-2)(a-4)}\right):\frac{2a-1}{(a-4)(a-1)}=$

$=\left(\frac{a^2-4a+1a-4-a^2+2a-3a+6}{(a-2)(a-4)}\right):\frac{2a-1}{(a-4)(a-1)}=$

$=\frac{-4a+2}{(a-2)(a-4)}:\frac{2a-1}{(a-4)(a-1)}=\frac{-2(2a-1)}{(a-4)(a-2)}\cdot\frac{(a-4)(a-1)}{2a-1}=\frac{-2(a-1)}{(a-2)}=\frac{-2a+2}{a-2}$

15. $\frac{2a^2+a-1}{a^2-16}:\frac{a^2-2a-3}{a+4}+\frac{a+2}{a-3}=$

$=\frac{(2a-1)(a+1)}{(a-4)(a+4)}\cdot\frac{(a-3)(a+1)}{a+4}+\frac{a+2}{a-3}=$

$=\frac{(2a-1)(a+1)}{(a-4)(a+4)}\cdot\frac{a+4}{(a-3)(a+1)}+\frac{a+2}{a-3}=$

$=\frac{(2a-1)}{(a-4)(a-3)}+\frac{a+2}{a-3}\overset{a-4}{=}\frac{2a-1+a^2-4a+2a-8}{(a-4)(a-3)}=\frac{a^2-9}{(a-4)(a-3)}=\frac{(a-3)(a+3)}{(a-4)(a-3)}=\frac{a+3}{a-4}$

16. $\frac{a-5}{a^2+18a+81}:\frac{a^2-25}{3a+72}+\frac{a+3}{a+5}=$

$=\frac{a-5}{(a+9)(a+9)}:\frac{(a-5)(a+5)}{8(a+9)}+\frac{a+3}{a+5}=$

$=\frac{a-5}{(a+9)(a+9)}\cdot\frac{8(a+9)}{(a-5)(a+5)}+\frac{a+3}{a+5}=$

$=\frac{8}{(a+9)(a+5}+\frac{a+3}{a+5}\overset{(a+9)}{=}\frac{8+a^2+9a+3a+27}{(a+5)(a+9)}=\frac{a^2+12a+35}{(a+5)(a+9)}=\frac{(a+5)(a+7)}{(a+5)(a+9)}=\frac{a+7}{a+9}$

17. $\frac{2a+4}{a^2-2a-15} \cdot \frac{a+3}{a^2-2a-8} + \frac{a-1}{a^2-16} : \frac{a-1}{a^2+2a-8} =$

$= \frac{2(a+2)}{(a-5)(a+3)} \cdot \frac{a+3}{(a+4)(a+2)} + \frac{a-1}{(a+4)(a-4)} \cdot \frac{(a-2)(a+4)}{a-1} =$

$= \frac{2}{(a-5)(a-4)} + \frac{a-2}{(a-4)} =$

$= \frac{2+a^2-5a-2a+10}{(a-5)(a-4)} = \frac{a^2-7a+12}{(a-5)(a-4)} = \frac{(a-3)(a-4)}{(a-5)(a-4)} = \frac{a-3}{a-5}$

18. $\frac{a^2-9}{a-4} : \frac{a^2+2a-15}{a-4} - \frac{a-1}{a^2+6a+8} \cdot \frac{2a+4}{a^2+4a-5} =$

$= \frac{(a-3)(a+3)}{a-4} \cdot \frac{(a+5)(a-3)}{a+4} - \frac{a-1}{(a+4)(a+2)} \cdot \frac{2(a+2)}{(a+5)(a-1)} =$

$= \frac{(a-3)(a-3)}{a-4} \cdot \frac{a-4}{(a+5)(a-3)} - \frac{2}{(a+4)(a+5)} =$

$= \frac{a+3}{a+5} - \frac{2}{(a+4)(a+5)} = \frac{a^2+4a+3a+12-2}{(a+4)(a+5)} = \frac{a^2+7a+10}{(a+4)(a+5)} = \frac{(a+5)(a+2)}{(a+4)(a+5)} = \frac{a+2}{a+4}$

19 $\frac{a^2-8a+16}{a^2-4} : \frac{a-4}{a+2} - \frac{2a+6}{a^2+2a-15} \cdot \frac{a+5}{a^2+a-6} =$

$= \frac{(a+4)(a-4)}{(a-2)(a+2)} \cdot \frac{(a+2)}{a-4} - \frac{2(a+3)}{(a+5)(a-3)} \cdot \frac{a+5}{(a+3)(a-2)} =$

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

$= \frac{a^2-3a-4a+12-2}{(a-3)(a-2)} = \frac{a^2-7a+10}{(a-3)(a-2)} = \frac{(a-5)(a-2)}{(a-3)(a-2)} = \frac{a-5}{a-3}$

20. $\frac{2a^2+16a+24}{a^2+6a+9} : \frac{a^2-36}{a^2+a-6} - \frac{a^2-2a-8}{a^2+2a-3} : \frac{a^2-10a+24}{a^2+a-2} =$

$= \frac{2(a^2+8a+12)}{(a+3)(a+3)} : \frac{(a-6)(a+6)}{(a-2)(a+3)} - \frac{(a-4)(a+2)}{(a-1)(a+3)} : \frac{(a-12)(a-2)}{(a-1)(a+2)} =$

$= \frac{2(a+6)(a+2)}{(a+3)(a+3)} \cdot \frac{(a-2)(a+3)}{(a-6)(a+6)} - \frac{(a-4)(a+2)}{(a-1)(a+3)} \cdot \frac{(a-1)(a+2)}{(a-6)(a-4)} =$

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

$= \frac{2(a^2-2a+2a-4)}{(a+3)(a-6)} - \frac{a^2+4a+4}{(a+3)(a-6)} =$

$= \frac{2a^2-4a+4a-8-a^2-4a-4}{(a+3)(a-6)} = \frac{a^2-4a-12}{(a+3)(a-6)} = \frac{(a-6)(a+2)}{(a+3)(a-6)} = \frac{a+2}{a+3}$

21. $\left(\frac{a+1}{a+2}+\frac{a+3}{a+4}\right)\left(\frac{a+1}{a-2}-\frac{a+3}{a-4}\right)\cdot\frac{a^3+4a^2-4a-16}{-4a^2-20a-20}=$

$=\left(\frac{a^2+4a+a+4+a^2+2a+3a+6}{(a+2)(a+4)}\right)\cdot\left(\frac{a^2-4a+a+4-a^2-2a-3a-6}{(a-2)(a-4)}\right)\cdot\frac{a^2(a+4)-4(a+4)}{-4(a^2+5a+5)}=$

$=\frac{2a^2+10a+10}{(a+2)(a+4)}\cdot\frac{-2}{(a-2)(a-4)}\cdot\frac{(a+4)(a-2)(a+2)}{-4(a^2+5a+5)}=$

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

$=\frac{1}{(a-4)}$

BODI BOLJ PAZLJIVA ZAJŠI VEČ VRSTIC KOT PA DA HITIŠ !

22. $\left(\frac{a-3}{a+4}\cdot\frac{(a+2)}{a+2}-\frac{a-1}{a+2}\cdot\frac{a+4}{a+4}\right)\cdot\left(\frac{a+1}{a+2}\cdot\frac{a+4}{a+4}-\frac{a+3}{a+4}\cdot\frac{a+2}{a+2}\right)=$

$=\left(\frac{a^2+2a-3a-6}{(a+4)(a+2)}-\frac{a^2+4a-a-4}{(a+4)(a+2)}\right)\cdot\left(\frac{a^2+4a+a+4}{(a+2)(a+4)}-\frac{a^2+2a+3a+6}{(a+2)(a+4)}\right)=$

$=\left(\frac{a^2+2a-3a-6-a^2+4a-a+4}{(a+4)(a+2)}\right)\cdot\left(\frac{a^2+4a+a+4-a^2-2a-3a-6}{(a+2)(a+4)}\right)$

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

$=\frac{-4a-2}{-2}=\frac{-2(2a+1)}{-2}=2a+1$

23. $\left(\frac{a^{a-2}}{1}+\frac{1}{a-2}\right)\cdot\left(\frac{a}{1}^{a-1}-\frac{2}{a-1}\right)=$

$=\frac{a^2-2a+1}{a-2}\cdot\frac{a^2-a-2}{a-1}=$

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

24. $\left(\frac{a^{a+3}}{1}\cdot\frac{2}{a+3}\right)\cdot\left(\frac{1}{a+1}^{a+2}-\frac{1}{a+2}^{a+1}\right)=$

$=\frac{a^2+3a+2}{a+3}\cdot\left(\frac{a+2}{(a+1)(a+2)}-\frac{a+1}{(a+1)(a+2)}\right)=$

$=\frac{(a+2)(a+1)}{a+3}\cdot\frac{a+2-a-1}{(a+1)(a+2)}=$

$=\frac{(a+2)(a+1)}{a+3}\cdot\frac{1}{(a+1)(a+2)}=$

$=\frac{1}{a+3}$

25. $\left(\frac{a+3}{a-4}\cdot\frac{a-5}{a+6}-\frac{a-3}{a+4}:\frac{a-4}{a+4}\right)\cdot\frac{a^2+2a-24}{3a+3}=$

$\left(\frac{(a+3)(a-5)}{(a-4)(a+6)}-\frac{(a-3)(a+4)}{(a+6)(a-4)}\right)\cdot\frac{(a-4)(a+6)}{3(a+1)}=$

$\left(\frac{a^2-5a+3a-15-(a^2+4a-3a-12)}{(a-4)(a+6)}\right)\cdot\frac{(a-4)(a+6)}{3(a+1)}=$

$\frac{a^2-5a+3a-15-a^2-4a+3a+12}{(a-4)(a+6)}\cdot\frac{(a-4)(a+6)}{3(a+1)}=$

$\frac{-3a-3}{(a-4)(a+6)}\cdot\frac{(a-4)(a+6)}{3(a+1)}=\frac{-3(a+1)}{(a-4)(a+6)}\cdot\frac{(a-4)(a+6)}{3(a+1)}=\frac{-1}{1}=-1$

26. $\frac{a^2-1}{2a^3+1}\cdot\frac{4a^2-2a+1}{a+1}+\frac{a^2-8a+16}{a^2-4}:\frac{2a^2-7a-4}{a^2-2a}=$

$\frac{(a-1)(a+1)}{(2a+1)(4a^2-2a+1)}\cdot\frac{4a^2-2a+1}{a+1}+\frac{(a-4)(a-4)}{(a-2)(a+2)}\cdot\frac{a(a-2)}{(2a+1)(a-4)}=$

$\frac{a-1}{2a+1}+\frac{(a-4)a}{(a+2)(2a+1)}=$

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

27. $\frac{4a^2+2a+1}{a-1}:\frac{8a^3-1}{a^2-1}+\frac{a^2+2a}{2a^2+7a-4}:\frac{a^2+8a+16}{a^2-4}=$

$\frac{4a^2+2a+1}{a-1}\cdot\frac{(a-1)(a+1)}{(2a-1)(4a^2+2a+1)}+\frac{a(a+2)}{(2a-1)(a+4)}\cdot\frac{(a+4)(a+4)}{(a-2)(a+2)}=$

$\frac{a+1}{2a-1}+\frac{a(a+4)}{(2a-1)(a-2)}=$

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

28. $\frac{a^2-4}{8a^3-1}:\frac{a+2}{4a^2+2a+1}+\frac{a^2-2a+1}{a^2+6a+5}:\frac{2a^2-3a+1}{a^2-25}=$

$\frac{(a-2)(a+2)}{(2a-1)(4a^2+2a+1)}\cdot\frac{4a^2+2a+1}{a+2}+\frac{(a-1)(a-1)}{(a+5)(a+1)}\cdot\frac{(a-5)(a+5)}{(2a-1)(a-1)}=$

$\frac{(a-2)}{(2a-1)}+\frac{(a-1)(a-5)}{(a+1)(2a-1)}=$

$\frac{a^2+a-2a-2+a^2-5a-a+5}{(2a-1)(a+1)}=\frac{2a^2-7a+3}{(2a-1)(a+1)}=\frac{(2a-1)(a-3)}{(2a-1)(a+1)}=\frac{a-3}{a+1}$

29. $\frac{4a^2+6a+9}{a+3}:\frac{8a^3-27}{a^2-9}+\frac{2a^2-7a+6}{a^2+6a}\cdot\frac{a^2-36}{4a^2-12a+9}=$

$\frac{4a^2+6a+9}{a+3}\cdot\frac{(a-3)(a+3)}{(2a-3)(4a^2+6a+9)}+\frac{(2a-3)(a-2)}{a(a+6)}\cdot\frac{(a-6)(a+6)}{(2a-3)(2a-3)}=$

$\frac{a-3}{2a-3}+\frac{(a-2)(a-6)}{a(2a-3)}=$

$\frac{a^2-3a+a^2-6a-2a+12}{(2a-3)a}=\frac{2a^2-11a+12}{(2a-3)a}=\frac{(2a-3)(a-4)}{(2a-3)a}=\frac{a-4}{a}$

30. $\frac{a^3+64}{4a^2-25} : \frac{a^2+4a+16}{2a+5} + \frac{a^2-2a-3}{a^2+3a-4} : \frac{2a^2-5a-3}{a^2-3a-28} =$

$= \frac{(a-4)(a^2+4a+16)}{(2a-5)(2a+5)} \cdot \frac{2a+5}{a^2+4a+16} + \frac{(a-3)(a+1)}{(a-1)(a+4)} \cdot \frac{(a-7)(a+4)}{(2a-5)(a+1)} =$

$= \frac{a-4}{2a-5} + \frac{(a-3)(a-7)}{(a-1)(2a-5)} =$

$= \frac{a^2-a-4a+4+a^2-7a-3a+21}{(2a-5)(a-1)} = \frac{2a^2-15a+25}{(2a-5)(a-1)} = \frac{(2a-5)(a-5)}{(2a-5)(a-1)} = \frac{a-5}{a-1}$

31. $\frac{a+2}{a^2+6a+36} : \frac{a^2-4}{a^3-216} - \frac{a^2-3a-4}{a^2-4a+4} : \frac{2a^2-5a-7}{a^2-10a+16} =$

$= \frac{a+2}{a^2+6a+36} \cdot \frac{(a-6)(a^2+6a+36)}{(a-2)(a+2)} - \frac{(a-4)(a+1)}{(a-2)(a-2)} \cdot \frac{(a-2)(a-2)}{(2a-7)(a+1)} =$

$= \frac{a-6}{(a-2)} - \frac{(a-4)(a-8)}{(a-2)(2a-7)} =$

$= \frac{2a^2-7a-12a+42}{(a-2)(2a-7)} - \frac{a^2-8a-4a+32}{(a-2)(2a-7)} = \frac{2a^2-7a-12a+42-a^2+12a-32}{(a-2)(2a-7)} = \frac{a^2-7a+10}{(a-2)(2a-7)} = \frac{(a-5)(a-2)}{(a-2)(2a-7)} = \frac{a-5}{2a-7}$

32. $\frac{a^2-1}{a^3+27} : \frac{a+1}{a^2-3a+9} - \frac{a^2-9}{2a^2+a-3} : \frac{a^2+6a+9}{a^2-1} =$

$= \frac{(a-1)(a+1)}{(a+3)(a^2-3a+9)} \cdot \frac{a^2-3a+9}{a+1} - \frac{(a-3)(a+3)}{(2a+3)(a-1)} \cdot \frac{(a-1)(a+1)}{(a+3)(a+3)} =$

$= \frac{a-1}{a+3} - \frac{(a-3)(a+1)}{(2a+3)(a+3)} =$

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

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

33. $\frac{a^3-16a}{a^3+64} : \frac{a^2-16}{a^2-4a+16} - \frac{a^2+2a-8}{2a^2+a-10} : \frac{a^2+8a+16}{a^2-4} =$

$= \frac{a(a-4)(a+4)}{(a+4)(a^2-4a+16)} \cdot \frac{a^2-4a+16}{(a+4)(a-4)} - \frac{(a-2)(a+4)}{(2a+5)(a-2)} \cdot \frac{(a-2)(a+2)}{(a+4)(a+4)} =$

$= \frac{a}{a+4} - \frac{(a-2)(a+2)}{(2a+5)(a+4)} =$

$= \frac{2a^2+5a}{(a+4)(2a+5)} - \frac{a^2+2a-2a-4}{(2a+5)(a+4)} =$

$= \frac{2a^2+5a-a^2+4}{(a+4)(2a+5)} = \frac{a^2+5a+4}{(a+4)(2a+5)} = \frac{(a+4)(a+1)}{(a+4)(2a+5)} = \frac{a+1}{2a+5}$

34. $\frac{a^2-5a+25}{a-1} : \frac{a^3+125}{a^2-1} \cdot \frac{a^2+2a+3}{a^2-25} : \frac{2a^2+5a-7}{a^2-6a+5} =$

$= \frac{a^2-5a+25}{a-1} \cdot \frac{(a-1)(a+1)}{(a+5)(a^2-5a+25)} \cdot \frac{(a-1)(a+3)}{(a-5)(a+5)} \cdot \frac{(a-5)(a-1)}{(2a+7)(a-1)} =$

$= \frac{a+1}{a+5} \cdot \frac{(a+3)(a+1)}{(a+5)(2a+7)} =$

$= \frac{2a^2+7a+2a+7}{(a+5)(2a+7)} \cdot \frac{a^2+a+3a+3}{(a+5)(2a+7)} =$

$= \frac{2a^2+9a+7+a^2+2a+3}{(a+5)(2a+7)} = \frac{a^2+7a+10}{(a+5)(2a+7)} = \frac{(a+5)(a+2)}{(a+5)(2a+7)} = \frac{a+2}{2a+7}$

35. $\frac{4a^2-25}{a^3-8} : \frac{2a+5}{a^2+2a+4} \cdot \frac{a^2-1}{a^3+4a^2+16a} : \frac{a^2-a-2}{a^3-64} =$

$= \frac{(2a-5)(2a+5)}{(a-2)(a^2+2a+4)} \cdot \frac{a^2+2a+4}{2a+5} \cdot \frac{(a-1)(a+1)}{a(a^2+4a+16)} \cdot \frac{(a-4)(a^2+4a+16)}{(a-2)(a+1)} =$

$= \frac{2a-5}{a-2} \cdot \frac{(a-1)(a-4)}{a(a-2)} =$

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

$= \frac{2a^2-5a-a^2+5a-4}{a(a-2)} = \frac{a^2-4}{a(a-2)} = \frac{(a-2)(a+2)}{a(a-2)} = \frac{a+2}{a}$

$= \frac{a-5}{2a-7}$

36. $\frac{a^2-2a+4}{2a-5} : \frac{a^3+8}{4a^2-25} \cdot \frac{a^3+64}{a^2+a-2} : \frac{a^3-4a^2+16a}{a^2-1} =$

$= \frac{a^2-2a+4}{2a-5} \cdot \frac{(2a-5)(2a+5)}{(a+2)(a^2-2a+4)} \cdot \frac{(a+4)(a^2-4a+16)}{(a-1)(a+2)} \cdot \frac{(a-1)(a+1)}{a(a^2-4a+16)} =$

$= \frac{2a+5}{a+2} \cdot \frac{(a+4)(a+1)}{a(a+2)} =$

$= \frac{2a^2+5a}{a(a+2)} \cdot \frac{a^2+a+4a+4}{a(a+2)} =$

$= \frac{2a^2+5a+a^2-5a-4}{a(a+2)} = \frac{a^2-4}{a(a+2)} = \frac{(a-2)(a+2)}{a(a+2)} = \frac{a-2}{a}$

37. $\frac{4a^2-12a+9}{a^3-1} : \frac{2a-3}{a^2+a+1} \cdot \frac{a^3+a^2+a}{a^2+4a+3} : \frac{a^3-1}{a^2-9} =$

$= \frac{(2a-3)(2a-3)}{(a-1)(a^2+a+1)} \cdot \frac{a^2+a+1}{2a-3} \cdot \frac{a(a^2+a+1)}{(a+3)(a+1)} \cdot \frac{(a-3)(a+3)}{(a-1)(a^2+a+1)} =$

$= \frac{2a-3}{a-1} \cdot \frac{a(a-3)}{(a+1)(a-1)} =$

$= \frac{2a^2+2a-3a-3}{(a+1)(a+1)} \cdot \frac{(a^2-3a)}{(a+1)(a-1)} =$

$= \frac{2a^2-a-3-a^2+3a}{(a-1)(a+1)} = \frac{a^2+2a-3}{(a-1)(a+1)} = \frac{(a+3)(a-1)}{(a-1)(a+1)} = \frac{a+3}{a+1}$

38. $\frac{a^2-a+1}{2a+3} : \frac{a^3+1}{4a^2+12a+9} - \frac{a^2-9}{a^3+1} : \frac{a^2-4a+3}{a^3-a^2+a} =$

$= \frac{a^2-a+1}{2a+3} \cdot \frac{(2a+3)(2a+3)}{(a+1)(a^2-a+1)} - \frac{(a+3)(a-3)}{(a+1)(a^2-a+1)} \cdot \frac{a(a^2-a+1)}{(a-3)(a-1)} =$

$= \frac{2a+3}{a+1} - \frac{(a+3)a}{(a+1)(a-1)} =$

$= \frac{2a^2+2a+3a-3-a^2-3a}{(a+1)(a-1)} = \frac{a^2-2a-3}{(a+1)(a-1)} = \frac{(a-3)(a+1)}{(a+1)(a-1)} = \frac{a-3}{a-1}$

39. $\frac{9a^2-16}{a^3+8} : \frac{3a-4}{a^2-2a+4} + \frac{a^2-2a}{a^3+1} : \frac{a^2-4}{a^2-a+1} =$

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

$= \frac{3a+4}{(a+2)} + \frac{a}{(a+1)(a+2)} =$

$= \frac{3a^2+3a+4a+4+a}{(a+1)(a+2)} = \frac{3a^2+8a+4}{(a+1)(a+2)} = \frac{(3a+2)(a+2)}{(a+1)(a+2)} = \frac{3a+2}{a+1}$

40. $\frac{a^2+2a+4}{3a+4} : \frac{a^3-8}{9a^2-16} - \frac{a^2+a+1}{a^2-4} : \frac{a^3+1}{a^2+2a} =$

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

$= \frac{3a-4}{a-2} - \frac{a}{(a-2)(a-1)} =$

$= \frac{3a^2-3a+4a+4-a}{(a-2)(a-1)} = \frac{3a^2-8a+4}{(a-2)(a-1)} = \frac{(3a-2)(a-2)}{(a-2)(a-1)} = \frac{3a-2}{a-1}$

41. $\frac{4a^2-1}{a^3+64} \cdot \frac{a^2-4a+16}{2a+1} - \frac{a^2+3a-4}{a^2-a-90} : \frac{a^2+8a+16}{a^2+3a-130} =$

$= \frac{(2a-1)(2a+1)}{(a+4)(a^2-4a+16)} \cdot \frac{a^2-4a+16}{2a+1} - \frac{(a+4)(a-1)}{(a-10)(a+9)} \cdot \frac{(a-10)(a+13)}{(a+4)(a+4)} =$

$= \frac{2a-1}{a+4} - \frac{(a-1)(a+13)}{(a+9)(a+4)} =$

$= \frac{2a^2+18a-a-9}{(a+4)(a+9)} - \frac{a^2+13a-a-13}{(a+9)(a+4)} =$

$= \frac{2a^2+17a-9-a^2-12a+13}{(a+4)(a+9)} = \frac{a^2+5a+4}{(a+4)(a+9)} = \frac{(a+4)(a+1)}{(a+4)(a+9)} = \frac{a+1}{a+9}$

42. $\frac{4a^2-9}{a^3+27} \cdot \frac{a^2-3a+9}{2a+3} - \frac{a^2-4a+4}{a^2-3a-88} : \frac{a^2+a-6}{a^2+a-132} =$

$= \frac{(2a-3)(2a+3)}{(a+3)(a^2-3a+9)} \cdot \frac{a^2-3a+9}{2a+3} - \frac{(a-2)(a-2)}{(a-11)(a+8)} \cdot \frac{(a+12)(a-11)}{(a+3)(a-2)} =$

$= \frac{2a-3}{a+3} - \frac{(a-2)(a+12)}{(a+8)(a+3)} =$

$= \frac{2a^2+16a-3a-24}{(a+3)(a+8)} - \frac{a^2+12a-2a-24}{(a+8)(a+3)} =$

$= \frac{2a^2+13a-24-a^2-10a+24}{(a+3)(a+8)} = \frac{a^2+3a}{(a+3)(a+8)} = \frac{a(a+3)}{(a+3)(a+8)} = \frac{a}{a+8}$

43. $\frac{4a^2-25}{a^3+8} \cdot \frac{a^2-2a+4}{2a+5} - \frac{a^2-a-6}{a^2-2a-63} : \frac{a^2+4a+4}{a^2+2a-99} =$

$= \frac{(2a-5)(2a+5)}{(a+2)(a^2-2a+4)} \cdot \frac{a^2-2a+4}{2a+5} - \frac{(a-3)(a+2)}{(a-9)(a+7)} \cdot \frac{(a-9)(a+11)}{(a+2)(a+2)} =$

$= \frac{2a-5}{a+2} - \frac{(a-3)(a+11)}{(a+7)(a+2)} =$

$= \frac{2a^2+14a-5a-35}{(a+2)(a+7)} - \frac{a^2+11a-3a-33}{(a+7)(a+2)} =$

$= \frac{2a^2+9a-35-a^2+8a+33}{(a+2)(a+7)} = \frac{a^2+a-2}{(a+2)(a+7)} = \frac{(a-1)(a+2)}{(a+2)(a+7)} = \frac{a-1}{a+7}$

44. $\frac{4a^2-49}{a^3+1} : \frac{2a+7}{a^2-a+1} - \frac{a^2-8a+16}{a^2-2a-48} \cdot \frac{a^2+2a-80}{a^2-3a-4} =$

$= \frac{(2a-7)(2a+7)}{(a+1)(a^2-1a+1)} \cdot \frac{a^2-a+1}{2a+7} - \frac{(a-4)(a-4)}{(a-8)(a+6)} \cdot \frac{(a+10)(a-8)}{(a-4)(a+1)} =$

$= \frac{2a-7}{a+1} - \frac{(a-4)(a+10)}{(a+6)(a+1)} =$

$= \frac{2a^2+12a-7a-42}{(a+1)(a+6)} - \frac{a^2+10a-4a-40}{(a+6)(a+1)} =$

$= \frac{2a^2+5a-42-a^2-6a+40}{(a+6)(a+1)} = \frac{a^2-a-2}{(a+6)(a+1)} = \frac{(a+1)(a-2)}{(a+6)(a+1)} = \frac{a-2}{a+6}$

45. $\frac{4a^2-81}{a^3+7a} : \frac{2a+9}{a^2+7} - \frac{a^3-125}{a^2-2a-35} \cdot \frac{a^2+2a-63}{a^3+5a^2+25a} =$

$= \frac{(2a-9)(2a+9)}{a(a^2+7)} \cdot \frac{a^2+7}{2a+9} - \frac{(a-5)(a^2+5a+25)}{(a-7)(a+5)} \cdot \frac{(a-7)(a+9)}{a(a^2+5a+25)} =$

$= \frac{2a-9}{a} - \frac{(a-5)(a+9)}{(a+5)a} =$

$= \frac{2a^2+10a-9a-45}{a(a+5)} - \frac{a^2+9a-5a-45}{a(a+5)} =$

$= \frac{2a^2+a-45-a^2-4a+45}{a(a+5)} = \frac{a^2-3a}{a(a+5)} = \frac{a(a-3)}{a(a+5)} = \frac{a-3}{a+5}$

46. $\frac{4a^2-121}{a^3-1} : \frac{2a+11}{a^2+a+1} - \frac{a^2-7a+6}{a^2-2a-24} \cdot \frac{a^2+2a-48}{a^2-2a+1} =$

$= \frac{(2a-11)(2a+11)}{(a-1)(a^2+a+1)} \cdot \frac{a^2+a+1}{2a+11} - \frac{(a-6)(a-1)}{(a-6)(a+4)} \cdot \frac{(a+8)(a-6)}{(a-1)(a-1)} =$

$= \frac{2a-11}{a-1} - \frac{(a-6)(a+8)}{(a+4)(a-1)} =$

$= \frac{2a^2+8a-11a-44}{(a+4)(a-1)} - \frac{a^2+8a-6a-48}{(a+4)(a-1)} =$

$= \frac{2a^2-3a-44-a^2-2a+48}{(a+4)(a-1)} = \frac{a^2-5a+4}{(a+4)(a-1)} = \frac{(a-4)(a-1)}{(a+4)(a-1)} = \frac{a-4}{a+4}$

47. $\frac{a}{a-5} + \frac{a^2-9a-10}{a^2-7a+12} \cdot \frac{a-3}{(a-2)^2-9} =$

$= \frac{a}{a-5} + \frac{(a-10)(a+1)}{(a-4)(a-3)} \cdot \frac{(a-3)}{a^2-4a+4-9} =$

$= \frac{a}{a-5} + \frac{(a-10)(a+1)}{(a-4)(a^2-4a-5)} =$

$= \frac{a(a-4)}{a-5} + \frac{(a-10)(a+1)}{(a-4)(a-5)(a+1)} =$

$= \frac{a^2-4a+a-10}{(a-5)(a-4)} = \frac{a^2-3a-10}{(a-5)(a-4)} = \frac{(a-5)(a+2)}{(a-5)(a-4)} = \frac{a+2}{a-4}$

48. $\frac{a^2+8a-9}{a^2+a-6} : \frac{a^2-1}{a-2} + \frac{a-3}{a+1} =$

$= \frac{(a-1)(a+9)}{(a+3)(a-2)} \cdot \frac{a-2}{(a-1)(a+1)} + \frac{a-3}{a+1} =$

$= \frac{a+9}{(a+3)(a+1)} + \frac{a-3}{a+1} \cdot \frac{a+3}{a+3} =$

$= \frac{a+9+a^2+3a-3a-9}{(a+3)(a+1)} = \frac{a^2+a}{(a+3)(a+1)} = \frac{a(a+1)}{(a+3)(a+1)} = \frac{a}{a+3}$

49. $\frac{a+2}{a+5} - \frac{a^2-121}{a^2+6a+5} \cdot \frac{a+1}{a^2-8a-33} =$

$= \frac{a+2}{a+5} - \frac{(a-11)(a+11)}{(a+5)(a+1)} \cdot \frac{(a+1)}{(a-11)(a+3)} =$

$= \frac{a+2}{a+5} \cdot \frac{a+3}{a+3} - \frac{a+11}{(a+5)(a+3)} =$

$= \frac{a^2+3a+2a+6-a-11}{(a+5)(a+3)} = \frac{a^2+4a-5}{(a+5)(a+3)} = \frac{(a-1)(a+5)}{(a+5)(a+3)} = \frac{a-1}{a+3}$

50. $\frac{a+1}{a+4} - \frac{a^2+9a-10}{a^2-a-6} : \frac{a^2+3a-4}{a-3} =$

$= \frac{a+1}{a+4} - \frac{(a-1)(a+10)}{(a-3)(a+2)} \cdot \frac{a-3}{(a-1)(a+4)} =$

$= \frac{a+1}{a+4} \cdot \frac{a+2}{} - \frac{a+10}{(a+2)(a+4)} =$

$= \frac{a^2+2a+a+2-a-10}{(a+4)(a+2)} = \frac{a^2+2a-8}{(a+4)(a+2)} = \frac{(a-2)(a+4)}{(a+4)(a+2)} = \frac{a-2}{a+2}$

51. $\frac{a^2+2a}{a-3} \cdot \frac{1-3a^{-1}}{a-4a^{-1}} - \frac{a^2+7a+12}{a^2-4a-5} \cdot \frac{a-5}{a^2+a-6} =$

$= \frac{a(a+2)}{a-3} \cdot \frac{1-3\cdot\frac{1}{a}}{a-4\cdot\frac{1}{a}} - \frac{(a+4)(a+3)}{(a-5)(a+1)} \cdot \frac{(a-5)}{(a-2)(a+3)} =$

$= \frac{a(a+2)}{a-3} \cdot \frac{1-\frac{3}{a}}{a-\frac{4}{a}} = \frac{(a+4)}{(a+1)(a-2)} =$

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

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

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

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

$= \frac{a(a+2)}{a-3} \cdot \frac{a(a-3)}{a(a+2)(a-2)} - \frac{a+4}{(a+1)(a-2)} =$

$= \frac{a}{a-2} - \frac{a+4}{(a+1)(a-2)} =$

$= \frac{a^2+a-a-4}{(a+1)(a-2)} = \frac{a^2-4}{(a+1)(a-2)} = \frac{(a-2)(a+2)}{(a+1)(a-2)} = \frac{a+2}{a+1}$

52. $\frac{a^2+8a+15}{a^2-4} : \frac{a^2+2a-3}{a-2} + (a-1-6a^{-1}) : (a+1-2a^{-1}) =$

$= \frac{(a+5)(a+3)}{(a+2)(a+2)} \cdot \frac{a-2}{(a-1)(a+3)} + a-1-6\cdot\frac{1}{a} : a+1-2\cdot\frac{1}{a} =$

$= \frac{a+5}{(a+2)(a-1)} + a-1-\frac{6}{a} : a+1-\frac{2}{a} =$

$= \frac{a+5}{(a+2)(a-1)} + \frac{a^2}{a} - \frac{1a}{a} - \frac{6}{a} : \frac{a^3}{a} + \frac{1a}{a} - \frac{2}{a} =$

$= \frac{a+5}{(a+2)(a-1)} + \frac{a^2-a-6}{a} \cdot \frac{a}{a^2+a-2} =$

$= \frac{a+5}{(a+2)(a-1)} + \frac{(a-3)(a+2)}{a} \cdot \frac{a}{(a+2)(a-1)} =$

$= \frac{a+5}{(a+2)(a-1)} + \frac{a-3}{a-1} =$

$= \frac{a+5+a^2-2a-3a-6}{(a+2)(a-1)} = \frac{a^2-1}{(a+2)(a-1)} = \frac{(a+1)(a-1)}{(a+2)(a-1)} = \frac{a+1}{a+2}$