Test 2

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

μ10

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

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2) $\frac{1}{3x+15} + \frac{x}{x^2-25} = \frac{x-5}{3(x+5)} + \frac{3}{(x-5)(x+5)}$

μ10

$EKP = 3(x-5)(x+5)$

$= \frac{x-5+3x}{3(x-5)(x+5)} = \frac{4x-5}{3(x-5)(x+5)}$

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3) a) $\frac{\frac{\alpha^3}{1}}{\alpha} - \frac{\frac{\alpha^2}{1}}{\alpha^2} + \frac{\frac{\alpha}{1}}{\alpha^3} - \frac{\frac{1}{1}}{\alpha^4}$ $\quad EKP = \alpha^4$

μ10

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

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

μ5

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

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4) а) $\frac{\alpha}{b} + \frac{b}{\alpha} - 1 = \frac{\alpha}{b} + \frac{b}{\alpha} - \frac{\alpha b}{\alpha b}$ ЕКП $= \alpha b$

μ5

$= \frac{\alpha^2 + b^2 - \alpha b}{\alpha b}$

б) $\frac{\frac{\alpha}{b^2}}{\frac{\alpha^2}{b} + \frac{b^2}{\alpha}}$ ЕКП $= \alpha b$

μ5

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

г) $\left(\frac{\alpha}{b} + \frac{b}{\alpha} - 1\right) : \left(\frac{\alpha^2}{b} + \frac{b^2}{\alpha}\right) =$

μ5

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

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5) $\frac{9\delta}{\delta^2 - \delta\epsilon} + \frac{3\epsilon}{\epsilon^2 - \delta\epsilon} = \frac{9\delta}{\delta(\delta-\epsilon)} + \frac{3\epsilon}{\epsilon(\epsilon-\delta)} =$

μ15

$= \frac{9\delta}{\delta(\delta-\epsilon)} - \frac{3\epsilon}{\epsilon(\delta-\epsilon)}$ ЕКП $= \delta\epsilon(\delta-\epsilon)$

$= \frac{9\delta\epsilon - 3\delta\epsilon}{\epsilon\delta(\delta-\epsilon)} = \frac{6\delta\epsilon}{\epsilon\delta(\delta-\epsilon)} = \frac{6}{\delta-\epsilon}$

6) $\frac{\alpha^2-6}{\alpha^2-5\alpha+6} - \frac{2}{\alpha-2} + \frac{3}{\alpha-3} =$

μ 1,5

Παραγοντοποιώ το $\alpha^2-5\alpha+6$

$\left.\begin{matrix} k+\lambda=-5 \\ k\cdot\lambda=6 \end{matrix}\right\} \Rightarrow \begin{matrix} k=-2 \\ \lambda=-3 \end{matrix}$

άρα $\alpha^2-5\alpha+6=(\alpha-2)(\alpha-3)$

$= \frac{\overset{1}{\alpha^2-6}}{(\alpha-2)(\alpha-3)} - \frac{\overset{\alpha-3}{2}}{\alpha-2} + \frac{\overset{\alpha-2}{3}}{\alpha-3}$

ΕΚΠ $=(\alpha-2)(\alpha-3)$

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

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

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

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

Παραγοντοποιώ το $\alpha^2+\alpha-6$

$\left.\begin{matrix} k+\lambda=1 \\ k\cdot\lambda=-6 \end{matrix}\right\} \Rightarrow \begin{matrix} k=3 \\ \lambda=-2 \end{matrix}$

7) $\frac{x+y}{1} - \frac{2xy-y^2}{x+y}$ $\quad$ ЕКП $= x+y$

μ10

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

$$= \frac{x^2+2xy+y^2-2xy+y^2}{x+y} = \frac{x^2+2y^2}{x+y}.$$

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8) $\frac{\mu^2-\nu^2}{x-y} \cdot \frac{x^2-y^2}{\nu-\mu} \cdot \frac{3}{x+y} \cdot \frac{4}{\mu+\nu} =$

μ10

$$= \frac{(\mu+\nu)(\mu-\nu)(x+y)(x-y)\cdot 12}{(x-y)(\nu-\mu)(x+y)(\mu+\nu)} = -\frac{12(\mu-\nu)}{\mu-\nu} = -12.$$

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9) $\left(1+\frac{\alpha}{\beta}\right) \frac{\alpha}{\alpha+\beta} = \frac{\beta+\alpha}{\beta} \cdot \frac{\alpha}{\alpha+\beta} = \frac{\alpha}{\beta}$

μ10
