15.9 1)

α) $\left(e^x\cdot x^7\cdot \sigma\upsilon\nu x\right)'=\left(e^x\right)'x^7\sigma\upsilon\nu x+e^x\left(x^7\right)'\sigma\upsilon\nu x+e^xx^7\left(\sigma\upsilon\nu x\right)'=$

$=e^xx^7\sigma\upsilon\nu x+7e^xx^6\sigma\upsilon\nu x-e^xx^7\eta\mu x$

β) $\left(x^4\cdot 5^x\cdot \ln x\cdot \varepsilon\varphi x\right)'=$

$=\left(x^4\right)'5^x\ln x\cdot\varepsilon\varphi x+x^4\left(5^x\right)'\ln x\cdot\varepsilon\varphi x+x^4\cdot 5^x\left(\ln x\right)'\varepsilon\varphi x+x^4\cdot 5^x\ln x\left(\varepsilon\varphi x\right)'=$

$=4x^3\cdot 5^x\ln x\cdot\varepsilon\varphi x+x^4\cdot 5^x\ln 5\ln x\cdot\varepsilon\varphi x+x^35^x\varepsilon\varphi x+\dfrac{x^45^x\ln x}{\sigma\upsilon\nu^2x}$

15.9 2)

$\left(5^x\right)'\ln x\cdot\varepsilon\varphi x+5^x\left(\ln x\right)'\varepsilon\varphi x+5^x\ln x\left(\varepsilon\varphi x\right)'=5^x\ln 5\cdot\ln x\cdot\varepsilon\varphi x+\dfrac{5^x\cdot\varepsilon\varphi x}{x}+\dfrac{5^x\ln x}{\sigma\upsilon\nu^2x}$

15.9 3)

$\left(x^5\right)'\eta\mu x\cdot\sigma\upsilon\nu x+x^5\left(\eta\mu x\right)'\sigma\upsilon\nu x+x^5\eta\mu x\left(\sigma\upsilon\nu x\right)'=5x^4\eta\mu x\cdot\sigma\upsilon\nu x+x^5\sigma\upsilon\nu^2x-x^5\eta\mu^2x$

15.9 4)

$\left(\dfrac{1}{x}\right)'\sigma\upsilon\nu x\cdot\ln x+\dfrac{1}{x}\left(\sigma\upsilon\nu x\right)'\ln x+\dfrac{1}{x}\sigma\upsilon\nu x\left(\ln x\right)'=-\dfrac{\sigma\upsilon\nu x\ln x}{x^2}-\dfrac{\eta\mu x\ln x}{x}+\dfrac{\sigma\upsilon\nu x}{x^2}$

15.9 5)

$\left(4^x\right)'\sqrt{x}\cdot\sigma\varphi x+4^x\left(\sqrt{x}\right)'\sigma\varphi x+4^x\sqrt{x}\left(\sigma\varphi x\right)'=4^x\ln 4\cdot\sqrt{x}\cdot\sigma\varphi x+\dfrac{4^x\sigma\varphi x}{2\sqrt{x}}-\dfrac{4^x\sqrt{x}}{\eta\mu^2x}$

15.9 6)

$\left(3^x\right)'x^6\sigma\upsilon\nu x+3^x\left(x^6\right)'\sigma\upsilon\nu x+3^xx^6\left(\sigma\upsilon\nu x\right)'=3^x\ln 3\cdot x^6\sigma\upsilon\nu x+6\cdot 3^xx^5\sigma\upsilon\nu x-3^xx^6\eta\mu x$

15.9 7)

$\left(\dfrac{1}{x}\right)'\ln x\cdot\sigma\varphi x+\dfrac{1}{x}\left(\ln x\right)'\sigma\varphi x+\dfrac{1}{x}\ln x\left(\sigma\varphi x\right)'=-\dfrac{\ln x\cdot\sigma\varphi x}{x^2}+\dfrac{\sigma\varphi x}{x^2}-\dfrac{\ln x}{x\eta\mu^2x}$

15.9 8)

$(x-1)'(x-2)x^2+(x-1)(x-2)'x^2+(x-1)(x-2)\left(x^2\right)'=$

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

15.6 9)

$(3x-2)'\left(x^2-8\right)\left(x^2-2x+7\right)+(3x+2)\left(x^2-8\right)'\left(x^2-2x+7\right)+(3x+2)\left(x^2-8\right)\left(x^2-2x+7\right)'=$

$=3\left(x^2-8\right)\left(x^2-2x+7\right)+2x(3x+2)\left(x^2-2x+7\right)+(3x+2)\left(x^2-8\right)(2x-2)$

15.9 10)

$(x)'\left(x^2+1\right)\left(x^3-2x\right)+x\left(x^2+1\right)'\left(x^3-2x\right)+x\left(x^2+1\right)\left(x^3-2x\right)'=$

$$=\left(x^2+1\right)\left(x^3-2x\right)+2x^2\left(x^3-2x\right)+x\left(x^2+1\right)\left(3x^2-2\right)$$

15.9 11)

$$\left(e^x\right)'3^x\eta\mu x\cdot\sigma\upsilon\nu x+e^x\left(3^x\right)'\eta\mu x\cdot\sigma\upsilon\nu x+e^x\cdot3^x\left(\eta\mu x\right)'\sigma\upsilon\nu x+e^x\cdot3^x\eta\mu x\left(\sigma\upsilon\nu x\right)'$$

$$=e^x\cdot3^x\cdot\eta\mu x\cdot\sigma\upsilon\nu x+e^x\cdot3^x\ln3\cdot\eta\mu x\cdot\sigma\upsilon\nu x+e^x\cdot3^x\sigma\upsilon\nu^2x-e^x\cdot3^x\cdot\eta\mu^2x$$

15.9 12)

$$\left(2x-1\right)'\left(5\eta\mu x+x^2\right)\left(\ln x+3e^x\right)\sigma\varphi x+\left(2x-1\right)\left(5\eta\mu x+x^2\right)'\left(\ln x+3e^x\right)\sigma\varphi x+$$

$$+\left(2x-1\right)\left(5\eta\mu x+x^2\right)\left(\ln x+3e^x\right)'\sigma\varphi x+\left(2x-1\right)\left(5\eta\mu x+x^2\right)\left(\ln x+3e^x\right)\left(\sigma\varphi x\right)'=$$

$$=2\left(5\eta\mu x+x^2\right)\left(\ln x+3e^x\right)\sigma\varphi x+\left(2x-1\right)\left(5\sigma\upsilon\nu x+2x\right)\left(\ln x+3e^x\right)\sigma\varphi x+$$

$$+\left(2x-1\right)\left(5\eta\mu x+x^2\right)\left(\frac{1}{x}+3e^x\right)\sigma\varphi x-\frac{\left(2x-1\right)\left(5\eta\mu x+x^2\right)\left(\ln x+3e^x\right)}{\eta\mu^2x}$$

15.9 13)

$$\left(\frac{1}{x}\right)'\cdot4^x\cdot\eta\mu x\cdot\ln x+\frac{1}{x}\cdot\left(4^x\right)'\cdot\eta\mu x\cdot\ln x+\frac{1}{x}\cdot4^x\cdot\left(\eta\mu x\right)'\cdot\ln x+\frac{1}{x}\cdot4^x\cdot\eta\mu x\cdot\left(\ln x\right)'=$$

$$=-\frac{4^x\cdot\eta\mu x\cdot\ln x}{x^2}+\frac{4^x\ln4\cdot\eta\mu x\cdot\ln x}{x}+\frac{4^x\cdot\sigma\upsilon\nu x\cdot\ln x}{x}+\frac{4^x\cdot\eta\mu x}{x^2}$$