15.25 1)

α) $\left[\sqrt{\varepsilon\varphi\left(2x^4-x\right)}\right]'=\frac{1}{2\sqrt{\varepsilon\varphi\left(2x^4-x\right)}}\left[\varepsilon\varphi\left(2x^4-x\right)\right]'=$

$=\frac{1}{2\sqrt{\varepsilon\varphi\left(2x^4-x\right)}}\frac{1}{\sigma\upsilon\nu^2\left(2x^4-x\right)}\left(2x^4-x\right)'=\frac{1}{2\sqrt{\varepsilon\varphi\left(2x^4-x\right)}}\frac{8x^3-1}{\sigma\upsilon\nu^2\left(2x^4-x\right)}$

β) $\left[\sigma\upsilon\nu^5\left(\eta\mu x\right)\right]'=5\sigma\upsilon\nu^4\left(\eta\mu x\right)\cdot\left[\sigma\upsilon\nu\left(\eta\mu x\right)\right]'=$

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

15.25 2)

$\left[\sqrt{\eta\mu\left(x^2+3x\right)}\right]'=\frac{1}{2\sqrt{\eta\mu\left(x^2+3x\right)}}\left[\eta\mu\left(x^2+3x\right)\right]'=$

$=\frac{1}{2\sqrt{\eta\mu\left(x^2+3x\right)}}\sigma\upsilon\nu\left(x^2+3x\right)\cdot\left(x^2+3x\right)'=\frac{1}{2\sqrt{\eta\mu\left(x^2+3x\right)}}\sigma\upsilon\nu\left(x^2+3x\right)\cdot\left(2x+3\right)$

15.25 3)

$\left[\sqrt{\sigma\upsilon\nu\left(\ln x\right)}\right]'=\frac{1}{2\sqrt{\sigma\upsilon\nu\left(\ln x\right)}}\left[\sigma\upsilon\nu\left(\ln x\right)\right]'=\frac{1}{2\sqrt{\sigma\upsilon\nu\left(\ln x\right)}}\left[-\eta\mu\left(\ln x\right)\right]\cdot\left(\ln x\right)'=$

$=\frac{-\eta\mu\left(\ln x\right)}{2x\sqrt{\sigma\upsilon\nu\left(\ln x\right)}}$

15.25 4)

$\left[\sqrt{\ln\left(\sigma\varphi x\right)}\right]'=\frac{1}{2\sqrt{\ln\left(\sigma\varphi x\right)}}\left[\ln\left(\sigma\varphi x\right)\right]'=\frac{1}{2\sqrt{\ln\left(\sigma\varphi x\right)}}\frac{1}{\sigma\varphi x}\left(\sigma\varphi x\right)'=$

$=\frac{1}{2\sqrt{\ln\left(\sigma\varphi x\right)}}\frac{1}{\sigma\varphi x}\frac{-1}{\eta\mu^2 x}$

15.25 5)

$\left[\sigma\upsilon\nu\left(\ln\left(\varepsilon\varphi x\right)\right)\right]'=-\eta\mu\left(\ln\left(\varepsilon\varphi x\right)\right)\cdot\left[\ln\left(\varepsilon\varphi x\right)\right]'=-\eta\mu\left(\ln\left(\varepsilon\varphi x\right)\right)\cdot\frac{1}{\varepsilon\varphi x}\left(\varepsilon\varphi x\right)'=$

$=-\eta\mu\left(\ln\left(\varepsilon\varphi x\right)\right)\cdot\frac{1}{\varepsilon\varphi x}\frac{1}{\sigma\upsilon\nu^2 x}$

15.25 6)

$\left[\sigma\varphi\left(\ln\left(\eta\mu x\right)\right)\right]'=-\frac{1}{\eta\mu^2\left(\ln\left(\eta\mu x\right)\right)}\left(\ln\left(\eta\mu x\right)\right)'=-\frac{1}{\eta\mu^2\left(\ln\left(\eta\mu x\right)\right)}\frac{1}{\eta\mu x}\left(\eta\mu x\right)'=$

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

15.25 7)

$\left[\varepsilon\varphi\left(\ln\sqrt{x}\right)\right]'=\frac{1}{\sigma\upsilon\nu^2\left(\ln\sqrt{x}\right)}\cdot\left(\ln\sqrt{x}\right)'=\frac{1}{\sigma\upsilon\nu^2\left(\ln\sqrt{x}\right)}\cdot\frac{1}{\sqrt{x}}\left(\sqrt{x}\right)'=$

$=\frac{1}{\sigma\upsilon\nu^2\left(\ln\sqrt{x}\right)}\cdot\frac{1}{\sqrt{x}}\frac{1}{2\sqrt{x}}=\frac{1}{2x\sigma\upsilon\nu^2\left(\ln\sqrt{x}\right)}$

15.25 8)

$$\left[\sigma\upsilon\nu\left(\sqrt{e^x+x}\right)\right]'=-\eta\mu\left(\sqrt{e^x+x}\right)\cdot\left(\sqrt{e^x+x}\right)'=$$

$$=-\eta\mu\left(\sqrt{e^x+x}\right)\cdot\frac{1}{2\sqrt{e^x+x}}\left(e^x+x\right)'=-\eta\mu\left(\sqrt{e^x+x}\right)\cdot\frac{1}{2\sqrt{e^x+x}}\left(e^x+1\right)$$

15.25 9)

$$\left[\sigma\upsilon\nu\left(\sqrt{3^x+x}\right)\right]'=-\eta\mu\left(\sqrt{3^x+x}\right)\cdot\left(\sqrt{3^x+x}\right)'=$$

$$=-\eta\mu\left(\sqrt{3^x+x}\right)\cdot\frac{1}{2\sqrt{3^x+x}}\left(3^x+x\right)'=-\eta\mu\left(\sqrt{3^x+x}\right)\cdot\frac{1}{2\sqrt{3^x+x}}\left(3^x\ln 3+1\right)$$

15.25 10)

$$\left(\ln\sqrt{5e^x+x^2}\right)'=\frac{1}{\sqrt{5e^x+x^2}}\cdot\left(\sqrt{5e^x+x^2}\right)'=\frac{1}{\sqrt{5e^x+x^2}}\cdot\frac{1}{2\sqrt{5e^x+x^2}}\left(5e^x+x^2\right)'=$$

$$=\frac{1}{\sqrt{5e^x+x^2}}\cdot\frac{1}{2\sqrt{5e^x+x^2}}\left(5e^x+2x\right)$$

15.25 11)

$$\ln\left[\varepsilon\varphi\left(5^x+x^4\right)\right]'=\frac{1}{\varepsilon\varphi\left(5^x+x^4\right)}\left[\varepsilon\varphi\left(5^x+x^4\right)\right]'$$

$$=\frac{1}{\varepsilon\varphi\left(5^x+x^4\right)}\frac{1}{\sigma\upsilon\nu^2\left(5^x+x^4\right)}\left(5^x+x^4\right)'=\frac{1}{\varepsilon\varphi\left(5^x+x^4\right)}\frac{1}{\sigma\upsilon\nu^2\left(5^x+x^4\right)}\left(5^x\ln 5+4x^3\right)=$$

15.25 12)

$$\left[\eta\mu\left(\sigma\upsilon\nu\left(\varepsilon\varphi x\right)\right)\right]'=\sigma\upsilon\nu\left(\sigma\upsilon\nu\left(\varepsilon\varphi x\right)\right)\cdot\left[\sigma\upsilon\nu\left(\varepsilon\varphi x\right)\right]'=$$

$$=\sigma\upsilon\nu\left(\sigma\upsilon\nu\left(\varepsilon\varphi x\right)\right)\cdot\left[-\eta\mu\left(\varepsilon\varphi x\right)\right]\left(\varepsilon\varphi x\right)'=-\sigma\upsilon\nu\left(\sigma\upsilon\nu\left(\varepsilon\varphi x\right)\right)\cdot\eta\mu\left(\varepsilon\varphi x\right)\frac{1}{\sigma\upsilon\nu^2 x}$$

15.25 13)

$$\left[\eta\mu\left(\eta\mu\left(\eta\mu x\right)\right)\right]'=\sigma\upsilon\nu\left(\eta\mu\left(\eta\mu x\right)\right)\cdot\left[\eta\mu\left(\eta\mu x\right)\right]'=$$

$$=\sigma\upsilon\nu\left(\eta\mu\left(\eta\mu x\right)\right)\cdot\sigma\upsilon\nu\left(\eta\mu x\right)\left(\eta\mu x\right)'=\sigma\upsilon\nu\left(\eta\mu\left(\eta\mu x\right)\right)\cdot\sigma\upsilon\nu\left(\eta\mu x\right)\sigma\upsilon\nu x=$$

15.25 14)

$$\left[e^{\eta\mu(\sigma\upsilon\nu x)}\right]'=e^{\eta\mu(\sigma\upsilon\nu x)}\left[\eta\mu\left(\sigma\upsilon\nu x\right)\right]'=e^{\eta\mu(\sigma\upsilon\nu x)}\sigma\upsilon\nu\left(\sigma\upsilon\nu x\right)\cdot\left(\sigma\upsilon\nu x\right)'=$$

$$=e^{\eta\mu(\sigma\upsilon\nu x)}\sigma\upsilon\nu\left(\sigma\upsilon\nu x\right)\cdot\left(-\eta\mu x\right)=-e^{\eta\mu(\sigma\upsilon\nu x)}\sigma\upsilon\nu\left(\sigma\upsilon\nu x\right)\cdot\eta\mu x$$

15.25 15)

$$\left(\frac{1}{\sqrt{\ln x}}\right)'=-\frac{1}{\sqrt{\ln x}^2}\left(\sqrt{\ln x}\right)'=-\frac{1}{\ln x}\frac{1}{2\sqrt{\ln x}}\left(\ln x\right)'=-\frac{1}{\ln x}\frac{1}{2\sqrt{\ln x}}\frac{1}{x}$$

15.25 16)

$$\left[4^{\ln(\varepsilon\varphi x)}\right]'=4^{\ln(\varepsilon\varphi x)}\ln 4\left[\ln\left(\varepsilon\varphi x\right)\right]'=4^{\ln(\varepsilon\varphi x)}\ln 4\frac{1}{\varepsilon\varphi x}\left(\varepsilon\varphi x\right)'=4^{\ln(\varepsilon\varphi x)}\ln 4\frac{1}{\varepsilon\varphi x}\frac{1}{\sigma\upsilon\nu^2 x}$$

15.25 17)

$$\left(7^{3^{\sigma\upsilon\nu x}}\right)'=7^{3^{\sigma\upsilon\nu x}}\ln 7\cdot\left(3^{\sigma\upsilon\nu x}\right)'=7^{3^{\sigma\upsilon\nu x}}\ln 7\cdot 3^{\sigma\upsilon\nu x}\ln 3\cdot\left(\sigma\upsilon\nu x\right)'=7^{3^{\sigma\upsilon\nu x}}\ln 7\cdot 3^{\sigma\upsilon\nu x}\ln 3\cdot\left(-\eta\mu x\right)=$$

$$= -7^{3^{\sigma\upsilon\nu x}} \ln 7 \cdot 3^{\sigma\upsilon\nu x} \ln 3 \cdot \eta\mu x$$

15.25 18)

$$\left[\eta\mu\left(\sigma\upsilon\nu 2x\right)\right]' = \sigma\upsilon\nu\left(\sigma\upsilon\nu 2x\right)\cdot\left(\sigma\upsilon\nu 2x\right)' = \sigma\upsilon\nu\left(\sigma\upsilon\nu 2x\right)\cdot\left(-\eta\mu 2x\right)\left(2x\right)' =$$
$$= -\sigma\upsilon\nu\left(\sigma\upsilon\nu 2x\right)\cdot\eta\mu 2x\cdot 2$$

15.25 19)

$$\left(\sqrt{2^{3x}}\right)' = \frac{1}{2\sqrt{2^{3x}}}\left(2^{3x}\right)' = \frac{1}{2\sqrt{2^{3x}}}2^{3x}\cdot\ln 2\cdot\left(3x\right)' = \frac{1}{2\sqrt{2^{3x}}}2^{3x}\cdot\ln 2\cdot 3$$

15.25 20)

$$\left(3^{\eta\mu 3x}\right)' = 3^{\eta\mu 3x}\ln 3\cdot\left(\eta\mu 3x\right)' = 3^{\eta\mu 3x}\ln 3\cdot\sigma\upsilon\nu 3x\cdot\left(3x\right)' = 3^{\eta\mu 3x}\ln 3\cdot\sigma\upsilon\nu 3x\cdot 3$$

15.25 21)

$$\left[\ln\left(\sqrt{x^2+x+3}\right)\right]' = \frac{1}{\sqrt{x^2+x+3}}\left(\sqrt{x^2+x+3}\right)' =$$
$$= \frac{1}{\sqrt{x^2+x+3}}\frac{1}{2\sqrt{x^2+x+3}}\left(x^2+x+3\right)' = \frac{1}{2\sqrt{x^2+x+3}^2}\left(2x+1\right) = \frac{2x+1}{2\left(x^2+x+3\right)}$$

15.25 22)

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

15.25 23)

$$\left[\eta\mu\left(\ln\left(\sqrt{x}-1\right)\right)\right]' = \sigma\upsilon\nu\left(\ln\left(\sqrt{x}-1\right)\right)\left[\ln\left(\sqrt{x}-1\right)\right]' =$$

$$= \sigma\upsilon\nu\left(\ln\left(\sqrt{x}-1\right)\right)\frac{1}{\sqrt{x}-1}\left(\sqrt{x}-1\right)' = \sigma\upsilon\nu\left(\ln\left(\sqrt{x}-1\right)\right)\frac{1}{\sqrt{x}-1}\frac{1}{2\sqrt{x}}$$

15.25 24)

$$\left(\sqrt{2\eta\mu 4x}\right)' = \frac{1}{2\sqrt{2\eta\mu 4x}}\cdot\left(2\eta\mu 4x\right)' = \frac{1}{\cancel{2}\sqrt{2\eta\mu 4x}}\cdot\left(\cancel{2}\sigma\upsilon\nu 4x\right)\cdot\left(4x\right)' =$$
$$= \frac{1}{\sqrt{2\eta\mu 4x}}\cdot\sigma\upsilon\nu 4x\cdot 4$$

15.25 25)

$$\left(\frac{1}{\sigma\upsilon\nu^2\left(\ln x\right)}\right)' = -\frac{1}{\sigma\upsilon\nu^4\left(\ln x\right)}\left[\sigma\upsilon\nu^2\left(\ln x\right)\right]' =$$

$$= -\frac{1}{\sigma\upsilon\nu^4\left(\ln x\right)}2\sigma\upsilon\nu\left(\ln x\right)\left[\sigma\upsilon\nu\left(\ln x\right)\right]' = -\frac{2\sigma\upsilon\nu\left(\ln x\right)}{\sigma\upsilon\nu^4\left(\ln x\right)}\left[-\eta\mu\left(\ln x\right)\right]\cdot\left(\ln x\right)' =$$

$$= \frac{2\sigma\upsilon\nu\left(\ln x\right)\eta\mu\left(\ln x\right)}{x\sigma\upsilon\nu^4\left(\ln x\right)}$$