Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Β

31.59

$$\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{1}{\eta\mu^2 x\sigma\upsilon\nu^2 x}dx = \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{1}{\eta\mu^2 x}\cdot\frac{1}{\sigma\upsilon\nu^2 x}dx = \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{1}{\eta\mu^2 x}(\varepsilon\varphi x)' dx =$$

$$= \left[\frac{1}{\eta\mu^2 x}\varepsilon\varphi x\right]_{\frac{\pi}{4}}^{\frac{\pi}{3}} - \int_{\frac{\pi}{4}}^{\frac{\pi}{3}}\left(\frac{1}{\eta\mu^2 x}\right)' \varepsilon\varphi x dx =$$

$$= \frac{1}{\eta\mu^2\frac{\pi}{3}}\varepsilon\varphi\frac{\pi}{3} - \frac{1}{\eta\mu^2\frac{\pi}{4}}\varepsilon\varphi\frac{\pi}{4} - \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} -\frac{2\,\cancel{\eta\mu x}\,\sigma\upsilon\nu x}{\eta\mu^{\cancel{4}\,3} x}\varepsilon\varphi x dx =$$

$$= \frac{1}{\left(\frac{\sqrt{3}}{2}\right)^2}\sqrt{3} - \frac{1}{\left(\frac{\sqrt{2}}{2}\right)^2} - \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} -\frac{2\,\cancel{\sigma\upsilon\nu x}}{\eta\mu^{\cancel{3}\,2} x}\frac{\cancel{\eta\mu x}}{\cancel{\sigma\upsilon\nu x}}dx =$$

$$= \frac{1}{\frac{3}{4}}\sqrt{3} - \frac{1}{\frac{\cancel{2}^{1}}{\cancel{4}_{2}}} - \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} -\frac{1}{\eta\mu^2 x}dx = \frac{4\sqrt{3}}{3} - 2 + 2\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{1}{\eta\mu^2 x}dx =$$

$$= \frac{4\sqrt{3}}{3} - 2 + 2\left[-\sigma\varphi x\right]_{\frac{\pi}{4}}^{\frac{\pi}{3}} = \frac{4\sqrt{3}}{3} - 2 + 2\left(-\sigma\varphi\frac{\pi}{3} + \sigma\varphi\frac{\pi}{4}\right) = \frac{4\sqrt{3}}{3} - 2 + 2\left(-\frac{\sqrt{3}}{3} + 1\right) =$$

$$= \frac{4\sqrt{3}}{3} - \cancel{2} - \frac{2\sqrt{3}}{3} + \cancel{2} = \frac{2\sqrt{3}}{3}$$