14.7 1)

α) $\alpha'\ \text{μέλος} = \eta\mu(\pi - x) + \eta\mu\left(\frac{\pi}{2} - x\right) + \eta\mu(\pi + x) + \eta\mu\left(\frac{3\pi}{2} - x\right)$

$\eta\mu(\pi-x)=\eta\mu x\ ,\ \eta\mu\left(\frac{\pi}{2}-x\right)=\sigma\upsilon\nu x\ ,\ \eta\mu(\pi+x)=-\eta\mu x\ ,\ \eta\mu\left(\frac{3\pi}{2}-x\right)=-\sigma\upsilon\nu x$

$= \eta\mu x + \sigma\upsilon\nu x - \eta\mu x - \sigma\upsilon\nu x = 0 = \beta'\ \text{μέλος}$

$\eta\mu(\pi-x)=\eta\mu x$

$\varepsilon\varphi\left(\frac{3\pi}{2}+x\right)=-\sigma\varphi x$

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

β) $\frac{\eta\mu(180^\circ - x)\cdot\varepsilon\varphi(270^\circ + x)}{\eta\mu(90^\circ - x)\cdot\varepsilon\varphi(360^\circ - x)} \overset{\varepsilon\varphi(2\pi-x)=-\varepsilon\varphi x}{=} \frac{\eta\mu x\cdot(-\sigma\varphi x)}{\sigma\upsilon\nu x\cdot(-\varepsilon\varphi x)} = \frac{-\eta\mu x\cdot\sigma\varphi x}{-\cancel{\sigma\upsilon\nu x}\cdot\frac{\eta\mu x}{\cancel{\sigma\upsilon\nu x}}} = \frac{\cancel{\eta\mu x}\cdot\sigma\varphi x}{\cancel{\eta\mu x}} = \sigma\varphi x$

14.7 2)

$\alpha'\ \text{μέλος} = \sigma\upsilon\nu(2\pi - x) + \sigma\upsilon\nu(\pi + x) + \eta\mu\left(\frac{3\pi}{2} + x\right) - \eta\mu\left(\frac{3\pi}{2} - x\right) =$

$= \sigma\upsilon\nu x + (-\sigma\upsilon\nu x) + (-\sigma\upsilon\nu x) - (-\sigma\upsilon\nu x) = 0 =$

$= \beta'\ \text{μέλος}$

14.7 3)

$\alpha'\ \text{μέλος} = \varepsilon\varphi(\pi + x) + \varepsilon\varphi(2\pi - x) + \varepsilon\varphi\left(\frac{\pi}{2} + x\right) - \sigma\varphi(-x) =$

$= \varepsilon\varphi x + (-\varepsilon\varphi x) + (-\sigma\varphi x) - (-\sigma\varphi x) = 0 =$

$= \beta'\ \text{μέλος}$

14.7 4)

$\alpha'\ \text{μέλος} = \frac{\eta\mu(\pi + \omega)\cdot\sigma\upsilon\nu\left(\frac{\pi}{2} - \omega\right)\cdot\varepsilon\varphi(\pi + \omega)}{\varepsilon\varphi(\pi - \omega)\cdot\eta\mu\left(\frac{3\pi}{2} + \omega\right)\cdot\sigma\varphi\left(\frac{\pi}{2} + \omega\right)} = \frac{(-\eta\mu\omega)\cdot\eta\mu\omega\cdot\varepsilon\varphi\omega}{(-\varepsilon\varphi\omega)\cdot(-\sigma\upsilon\nu\omega)\cdot(-\varepsilon\varphi\omega)} =$

$= \frac{-\eta\mu^2\omega\cdot\frac{\eta\mu\omega}{\cancel{\sigma\upsilon\nu\omega}}}{\frac{-\eta\mu\omega}{\cancel{\sigma\upsilon\nu\omega}}\cdot\cancel{(-\sigma\upsilon\nu\omega)}\cdot\frac{\eta\mu\omega}{\cancel{\sigma\upsilon\nu\omega}}} = -\eta\mu\omega =$

$= \beta'\ \text{μέλος}$

14.7 5)

$\alpha'\ \text{μέλος} = \frac{\eta\mu(180^\circ - \omega)\cdot\sigma\varphi(90^\circ - \omega)\cdot\sigma\upsilon\nu(180^\circ - \omega)}{\varepsilon\varphi(180^\circ + \omega)\cdot\varepsilon\varphi(90^\circ + \omega)\cdot\eta\mu(180^\circ + \omega)} = \frac{\eta\mu\omega\cdot\cancel{\varepsilon\varphi\omega}\cdot(-\sigma\upsilon\nu\omega)}{\cancel{\varepsilon\varphi\omega}\cdot(-\sigma\varphi\omega)\cdot(-\eta\mu\omega)} =$

$= \frac{-\eta\mu\omega\cdot\cancel{\sigma\upsilon\nu\omega}}{\frac{\cancel{\sigma\upsilon\nu\omega}}{\cancel{\eta\mu\omega}}\cdot\cancel{\eta\mu\omega}} = -\eta\mu\omega =$

$= \beta'$ μέλος

14.7 6)

$$\alpha' \text{μέλος} = \frac{\sigma\upsilon\nu\left(360^o - \omega\right) \cdot \eta\mu\left(180^o + \omega\right) \cdot \sigma\varphi\left(270^o - \omega\right)}{\sigma\upsilon\nu\left(360^o + \omega\right) \cdot \varepsilon\varphi\left(180^o - \omega\right) \cdot \sigma\upsilon\nu\left(90^o + \omega\right)} =$$

$$= \frac{\cancel{\sigma\upsilon\nu\omega} \cdot \cancel{\left(-\eta\mu\omega\right)} \cdot \cancel{\varepsilon\varphi\omega}}{\cancel{\sigma\upsilon\nu\omega} \cdot \cancel{\left(-\varepsilon\varphi\omega\right) \cdot \left(-\eta\mu\omega\right)}} = -1 =$$

$= \beta'$ μέλος

14.7 7)

$$\alpha' \text{μέλος} = \eta\mu\left(90^o - \omega\right) \cdot \sigma\upsilon\nu\left(-\omega\right) + \sigma\upsilon\nu\left(90^o - \omega\right) \cdot \eta\mu\left(180^o - \omega\right) =$$

$$= \sigma\upsilon\nu\omega \cdot \sigma\upsilon\nu\omega + \eta\mu\omega \cdot \eta\mu\omega = \sigma\upsilon\nu^2\omega + \eta\mu^2\omega = 1 = \beta' \text{ μέλος}$$

$= \beta'$ μέλος

14.7 8)

$$\alpha' \text{μέλος} = \varepsilon\varphi\left(\frac{\pi}{2} - \omega\right) \cdot \sigma\varphi\left(\frac{3\pi}{2} - \omega\right) + \eta\mu^2\left(2\pi - \omega\right) + \sigma\upsilon\nu^2\left(\pi + \omega\right) =$$

$$= \varepsilon\varphi\left(\frac{\pi}{2} - \omega\right) \cdot \sigma\varphi\left(\pi + \frac{\pi}{2} - \omega\right) + \left(-\eta\mu\omega\right)^2 + \left(-\sigma\upsilon\nu\omega\right)^2 =$$

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

$= \beta'$ μέλος