

16.6 1)

- Για να λύσουμε αυτή την άσκηση θα χρειαστεί να θυμηθούμε από την παράγραφο «**αναγωγή στο πρώτο τεταρτημόριο**» τους τύπους

$$-\eta\mu\omega = \eta\mu(-\omega)$$

$$-\epsilon\varphi\omega = \epsilon\varphi(-\omega)$$

$$-\sigma\varphi\omega = \sigma\varphi(-\omega)$$

όμως επειδή **ΔΕΝ ΙΣΧΥΕΙ** $-\sigma\upsilon\nu\omega = \sigma\upsilon\nu(-\omega)$

ειδικά για το συνημίτονο θα χρησιμοποιήσουμε τον τύπο $-\sigma\upsilon\nu\omega = \sigma\upsilon\nu(\pi - \omega)$

α) $\eta\mu x = -\frac{1}{2} \Rightarrow \eta\mu x = -\eta\mu \frac{\pi}{6} \Rightarrow \eta\mu x = \eta\mu\left(-\frac{\pi}{6}\right) \Rightarrow x = 2\kappa\pi - \frac{\pi}{6}$ ή $x = 2\kappa\pi + \pi + \frac{\pi}{6} = 2\kappa\pi + \frac{7\pi}{6}$, $\kappa \in \mathbb{Z}$

β) $\sigma\upsilon\nu x = -\frac{\sqrt{2}}{2} \Rightarrow \sigma\upsilon\nu x = -\sigma\upsilon\nu \frac{\pi}{4} \Rightarrow$

ΠΡΟΣΟΧΗ: Τώρα είναι λάθος να συνεχίσουμε με $\sigma\upsilon\nu x = \sigma\upsilon\nu\left(-\frac{\pi}{4}\right)$ (διότι το $\sigma\upsilon\nu\left(-\frac{\pi}{4}\right)$ κάνει

$\sigma\upsilon\nu \frac{\pi}{4}$ και όχι $-\sigma\upsilon\nu \frac{\pi}{4}$!!). Γι' αυτό συνεχίζουμε ως εξής

$$\Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu\left(\pi - \frac{\pi}{4}\right) \Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu \frac{3\pi}{4} \Rightarrow x = 2\kappa\pi + \frac{3\pi}{4}$$
 ή $x = 2\kappa\pi - \frac{3\pi}{4}$, $\kappa \in \mathbb{Z}$

γ) $\epsilon\varphi x = -\sqrt{3} \Rightarrow \epsilon\varphi x = -\epsilon\varphi \frac{\pi}{3} \Rightarrow \epsilon\varphi x = \epsilon\varphi\left(-\frac{\pi}{3}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{3}$, $\kappa \in \mathbb{Z}$

δ) $\sigma\varphi x = -1 \Rightarrow \sigma\varphi x = -\sigma\varphi \frac{\pi}{4} \Rightarrow \sigma\varphi x = \sigma\varphi\left(-\frac{\pi}{4}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{4}$, $\kappa \in \mathbb{Z}$

16.6 2)

$$\eta\mu x = -\frac{\sqrt{3}}{3} \Rightarrow \eta\mu x = -\eta\mu\left(-\frac{\pi}{3}\right) \Rightarrow \eta\mu x = \eta\mu\left(-\frac{\pi}{3}\right) \Rightarrow$$

$$\Rightarrow x = 2\kappa\pi - \frac{\pi}{3}$$
 ή $x = 2\kappa\pi + \pi - \frac{\pi}{3} = 2\kappa\pi + \frac{2\pi}{3}$, $\kappa \in \mathbb{Z}$

16.6 3)

$$\epsilon\varphi x = -\frac{\sqrt{3}}{3} \Rightarrow \epsilon\varphi x = -\epsilon\varphi \frac{\pi}{6} \Rightarrow \epsilon\varphi x = \epsilon\varphi\left(-\frac{\pi}{6}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{6}$$
, $\kappa \in \mathbb{Z}$

16.6 4)

$$\sigma\varphi x = -\sqrt{3} \Rightarrow \sigma\varphi x = -\sigma\varphi \frac{\pi}{6} \Rightarrow \sigma\varphi x = \sigma\varphi\left(-\frac{\pi}{3}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{3}$$
, $\kappa \in \mathbb{Z}$

16.6 5)

$$\sigma\upsilon\nu x = -\frac{\sqrt{3}}{2} \Rightarrow \sigma\upsilon\nu x = -\sigma\upsilon\nu \frac{\pi}{6} \Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu\left(\pi - \frac{\pi}{6}\right) \Rightarrow$$

$$\Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu \frac{5\pi}{6} \Rightarrow \sigma\upsilon\nu x = 2\kappa\pi \pm \frac{5\pi}{6}$$
, $\kappa \in \mathbb{Z}$

16.6 6)

$$\sigma\upsilon\nu x = -\frac{1}{2} \Rightarrow \sigma\upsilon\nu x = -\sigma\upsilon\nu \frac{\pi}{3} \Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu\left(\pi - \frac{\pi}{3}\right) \Rightarrow$$

$$\Rightarrow \sigma\upsilon\nu x = \sigma\upsilon\nu \frac{2\pi}{3} \Rightarrow x = 2\kappa\pi \pm \frac{2\pi}{3}$$
, $\kappa \in \mathbb{Z}$

16.6 7)

$$\varepsilon\varphi x = -1 \Rightarrow \varepsilon\varphi x = -\varepsilon\varphi \frac{\pi}{4} \Rightarrow \varepsilon\varphi x = \varepsilon\varphi\left(-\frac{\pi}{4}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{4}, \quad \kappa \in \mathbb{Z}$$

16.6 8)

$$\sigma\varphi x = -\frac{\sqrt{3}}{3} \Rightarrow \sigma\varphi x = -\sigma\varphi \frac{\pi}{3} \Rightarrow \sigma\varphi x = \sigma\varphi\left(-\frac{\pi}{3}\right) \Rightarrow x = \kappa\pi - \frac{\pi}{3}, \quad \kappa \in \mathbb{Z}$$

16.6 9)

$$\sigma\nu x = -1 \Rightarrow \sigma\nu x = \sigma\nu\pi \Rightarrow \sigma\nu x = 2\kappa\pi \pm \pi, \quad \kappa \in \mathbb{Z}$$

16.6 10)

$$\eta\mu x = -\frac{\sqrt{2}}{2} \Rightarrow \eta\mu x = -\eta\mu \frac{\pi}{4} \Rightarrow \eta\mu x = \eta\mu\left(-\frac{\pi}{4}\right) \Rightarrow$$

$$\Rightarrow x = 2\kappa\pi - \frac{\pi}{4} \quad \text{ή} \quad x = 2\kappa\pi + \pi + \frac{\pi}{4} = 2\kappa\pi + \frac{5\pi}{4}, \quad \kappa \in \mathbb{Z}$$

16.6 11)

$$\eta\mu x = -1 \Rightarrow \eta\mu x = -\eta\mu \frac{\pi}{2} \Rightarrow \eta\mu x = \eta\mu\left(-\frac{\pi}{2}\right) \Rightarrow x = 2\kappa\pi + \frac{\pi}{2}, \quad \kappa \in \mathbb{Z}$$