

ΒΛΥΚΕΙΟΥ ΑΛΓΕΒΡΑ

16.11 1)

$$\varepsilon\varphi\left(2x + \frac{\pi}{4}\right) = \varepsilon\varphi\left(x - \frac{\pi}{3}\right) \Rightarrow 2x + \frac{\pi}{4} = \kappa\pi + x - \frac{\pi}{3} \Rightarrow 2x - x = \kappa\pi - \frac{\pi}{3} - \frac{\pi}{4} \Rightarrow x = \kappa\pi - \frac{7\pi}{12}, \quad \kappa \in \mathbb{Z}$$

16.11 2)

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

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

16.11 3)

$$\eta\mu x = \eta\mu 2x \Rightarrow$$

$$\Rightarrow x = 2\kappa\pi + 2x \quad \begin{matrix} \\ \eta \end{matrix} \quad x = 2\kappa\pi + \pi - 2x$$

$$\Rightarrow x = -2\kappa\pi \quad \begin{matrix} \\ \eta \end{matrix} \quad \Rightarrow 3x = 2\kappa\pi + \pi$$

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

16.11 4)

$$\sigma\psi\nu\left(3x - \frac{\pi}{4}\right) = \sigma\psi\nu x \Rightarrow 3x - \frac{\pi}{4} = 2\kappa\pi \pm x$$

$$\Rightarrow 3x - \frac{\pi}{4} = 2\kappa\pi + x \quad \begin{matrix} \\ \eta \end{matrix} \quad 3x - \frac{\pi}{4} = 2\kappa\pi - x$$

$$\Rightarrow 2x = 2\kappa\pi + \frac{\pi}{4} \quad \begin{matrix} \\ \eta \end{matrix} \quad \Rightarrow 4x = 2\kappa\pi + \frac{\pi}{4}$$

$$\Rightarrow x = \kappa\pi + \frac{\pi}{8} \quad \begin{matrix} \\ \eta \end{matrix} \quad \Rightarrow x = \frac{\kappa\pi}{2} + \frac{\pi}{16}$$

$$\kappa \in \mathbb{Z}$$

16.11 5)

$$\varepsilon\varphi\left(x - \frac{\pi}{3}\right) = \varepsilon\varphi\left(\frac{\pi}{4} - x\right) \Rightarrow x - \frac{\pi}{3} = \kappa\pi + \frac{\pi}{4} - x \Rightarrow 2x = \kappa\pi + \frac{\pi}{4} + \frac{\pi}{3} \Rightarrow 2x = \kappa\pi + \frac{7\pi}{12} \Rightarrow$$

$$\Rightarrow x = \frac{\kappa\pi}{2} + \frac{7\pi}{24}, \quad \kappa \in \mathbb{Z}$$

16.11 6)

$$\eta\mu\left(x + \frac{\pi}{3}\right) = \eta\mu\left(2x - \frac{\pi}{6}\right) \Rightarrow$$

$$\Rightarrow x + \frac{\pi}{3} = 2\kappa\pi + 2x - \frac{\pi}{6} \quad \begin{matrix} \\ \eta \end{matrix} \quad x + \frac{\pi}{3} = 2\kappa\pi + \pi - 2x + \frac{\pi}{6}$$

$$\Rightarrow x = -2\kappa\pi + \frac{\pi}{2} \quad \begin{matrix} \\ \eta \end{matrix} \quad \Rightarrow 3x = 2\kappa\pi + \frac{5\pi}{6}$$

$$\kappa \in \mathbb{Z} \quad \begin{matrix} \\ \eta \end{matrix} \quad \Rightarrow x = \frac{2\kappa\pi}{3} + \frac{5\pi}{18}$$

$$\kappa \in \mathbb{Z}$$

16.11 7)

$$\sigma \cup \nu \left(3x - \frac{5\pi}{6} \right) = \sigma \cup \nu \left(x + \frac{\pi}{6} \right) \Rightarrow 3x - \frac{5\pi}{6} = 2\kappa\pi \pm \left(x + \frac{\pi}{6} \right) \Rightarrow$$

$$3x - \frac{5\pi}{6} = 2\kappa\pi + x + \frac{\pi}{6}$$

$$\Rightarrow 2x = 2\kappa\pi + \pi$$

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

$$\kappa \in \mathbb{Z}$$

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$$3x - \frac{5\pi}{6} = 2\kappa\pi - x - \frac{\pi}{6}$$

$$\Rightarrow 4x = 2\kappa\pi + \frac{2\pi}{3}$$

$$\Rightarrow x = \frac{\kappa\pi}{2} + \frac{\pi}{6}$$

$$\kappa \in \mathbb{Z}$$