

5. Να λύσετε τις εξισώσεις

i) $(1 - \eta\mu x)(2\eta\mu x - \sqrt{3}) = 0$

ii) $(2\eta\mu x + \sqrt{2})(1 - \sigma\upsilon\nu x) = 0$

$$\begin{aligned}
 1 - \eta\mu x &= 0 \quad \vee \quad 2\eta\mu x - \sqrt{3} = 0 \\
 \eta\mu x &= 1 & 2\eta\mu x &= \sqrt{3} \\
 \boxed{x = 2k\pi + \frac{\pi}{2}} & & \eta\mu x &= \frac{\sqrt{3}}{2} \\
 k \in \mathbb{Z} & & \eta\mu x &= \eta\mu \frac{\pi}{3} \\
 & & \boxed{x = 2k\pi + \frac{\pi}{3}} & \\
 & & \vee & \\
 & & x = 2k\pi + \pi - \frac{\pi}{3}, k \in \mathbb{Z} & \\
 & & \boxed{x = 2k\pi + \frac{2\pi}{3}} &
 \end{aligned}$$

$$\begin{aligned}
 2\eta\mu x + \sqrt{2} &= 0 \quad \vee \quad 1 - \sigma\upsilon\nu x = 0 \\
 2\eta\mu x &= -\sqrt{2} & \sigma\upsilon\nu x &= 1 \\
 \eta\mu x &= -\frac{\sqrt{2}}{2} & \boxed{x = 2k\pi} & \\
 \eta\mu x &= \eta\mu\left(-\frac{\pi}{4}\right) & & \\
 \boxed{x = 2k\pi - \frac{\pi}{4}} & & & \\
 \vee & & k \in \mathbb{Z} & \\
 x = 2k\pi + \pi - \left(-\frac{\pi}{4}\right) & & & \\
 \boxed{x = 2k\pi + \frac{5\pi}{4}} & & &
 \end{aligned}$$

6. Να λύσετε τις εξισώσεις

i) $(\sqrt{3} + \epsilon\varphi x)(1 - \epsilon\varphi x) = 0$

ii) $(2\sigma\upsilon\nu x + 1)(\epsilon\varphi^2 x - 3)\sigma\varphi x = 0$

$$\begin{aligned}
 \sqrt{3} + \epsilon\varphi x &= 0 \quad \vee \quad 1 - \epsilon\varphi x = 0 \\
 \epsilon\varphi x &= -\sqrt{3} & \epsilon\varphi x &= 1 \\
 \epsilon\varphi x &= \epsilon\varphi\left(-\frac{\pi}{3}\right) & \epsilon\varphi x &= \epsilon\varphi \frac{\pi}{4} \\
 \boxed{x = k\pi - \frac{\pi}{3}} & & \boxed{x = k\pi + \frac{\pi}{4}} & \\
 k \in \mathbb{Z} & & &
 \end{aligned}$$

για να οριζόταν η $\epsilon\varphi x$ πρέπει $x \neq k\pi + \frac{\pi}{2}$
για να οριζόταν η $\sigma\varphi x$ πρέπει $x \neq k\pi$

$$\begin{aligned}
 2\sigma\upsilon\nu x + 1 &= 0 \quad \vee \quad \epsilon\varphi^2 x - 3 = 0 \quad \vee \quad \sigma\varphi x = 0 \\
 2\sigma\upsilon\nu x &= -1 & \epsilon\varphi^2 x &= 3 & x &= k\pi + \frac{\pi}{2} \text{ απροσδιόριστο} \\
 \sigma\upsilon\nu x &= -\frac{1}{2} & \epsilon\varphi x &= \sqrt{3} \quad \vee \quad \epsilon\varphi x = -\sqrt{3} \\
 \sigma\upsilon\nu x &= \sigma\upsilon\nu\left(\frac{2\pi}{3}\right) & \epsilon\varphi x &= \epsilon\varphi \frac{\pi}{3} & \epsilon\varphi x &= \epsilon\varphi\left(-\frac{\pi}{3}\right) \\
 \boxed{x = 2k\pi \pm \frac{2\pi}{3}} & & \boxed{x = k\pi + \frac{\pi}{3}} & & \boxed{x = k\pi - \frac{\pi}{3}} & \\
 k \in \mathbb{Z} & & & & &
 \end{aligned}$$

8. Να λύσετε τις εξισώσεις

i) $2\eta\mu 3x = \sqrt{3}$

ii) $\sigma\upsilon\nu \frac{x}{5} + 1 = 0$

iii) $3\epsilon\varphi \frac{2x}{7} - \sqrt{3} = 0$

$$\begin{aligned}
 \eta\mu 3x &= \frac{\sqrt{3}}{2} \\
 \eta\mu 3x &= \eta\mu \frac{\pi}{3} \\
 3x &= 2k\pi + \frac{\pi}{3} \Rightarrow \\
 \underline{\underline{x = \frac{2k\pi}{3} + \frac{\pi}{9}}}
 \end{aligned}$$

$$\begin{aligned}
 \sigma\upsilon\nu \frac{x}{5} &= -1 \\
 \sigma\upsilon\nu \frac{x}{5} &= \sigma\upsilon\nu \pi \\
 x &= 5\pi
 \end{aligned}$$

$$\begin{aligned}
 3\epsilon\varphi \frac{2x}{7} &= \sqrt{3} \\
 \epsilon\varphi \frac{2x}{7} &= \frac{\sqrt{3}}{3} \\
 \frac{2x}{7} &= \frac{\pi}{6} \\
 x &= \frac{7\pi}{4}
 \end{aligned}$$

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

$$x = \frac{2k\pi}{3} + \frac{\pi}{9}$$

h

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

$$x = \frac{2k\pi}{3} + \frac{2\pi}{9}$$

$$\sin \frac{x}{5} = \sin \pi$$

$$\frac{x}{5} = 2k\pi + \pi$$

$$x = 10k\pi + 5\pi$$

k ∈ Z

$$\cos \frac{2x}{7} = \frac{1}{3}$$

$$\cos \frac{2x}{7} = \cos \frac{\pi}{6}$$

$$\frac{2x}{7} = k\pi + \frac{\pi}{6}$$

$$2x = 7k\pi + \frac{7\pi}{6}$$

$$x = \frac{7k\pi}{2} + \frac{7\pi}{12} \quad k \in \mathbb{Z}$$

9. Να λύσετε τις εξισώσεις

i) $\eta\mu\left(x + \frac{\pi}{3}\right) = -1$

ii) $2\sigma\upsilon\nu\left(3x - \frac{\pi}{4}\right) = 1$

iii) $\epsilon\varphi\left(\frac{\pi}{4} - 5x\right) = \sqrt{3}$

$$\sin\left(3x - \frac{\pi}{4}\right) = \frac{1}{2}$$

$$\sin\left(3x - \frac{\pi}{4}\right) = \sin \frac{\pi}{6}$$

$$3x - \frac{\pi}{4} = 2k\pi + \frac{\pi}{6} \quad \text{h} \quad 3x - \frac{\pi}{4} = 2k\pi - \frac{\pi}{6}$$

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

$$3x = 2k\pi - \frac{\pi}{3} + \frac{\pi}{4}$$

$$3x = 2k\pi + \frac{7\pi}{12}$$

$$3x = 2k\pi - \frac{\pi}{12}$$

$$x = \frac{2k\pi}{3} + \frac{7\pi}{36}$$

$$x = \frac{2k\pi}{3} - \frac{\pi}{36}$$

$$\cos\left(\frac{\pi}{4} - 5x\right) = \cos \frac{\pi}{3}$$

$$\frac{\pi}{4} - 5x = k\pi + \frac{\pi}{3}$$

$$-5x = k\pi + \frac{\pi}{3} - \frac{\pi}{4}$$

$$-5x = k\pi + \frac{\pi}{12}$$

$$x = -\frac{k\pi}{5} - \frac{\pi}{60}$$