

Β ΛΥΚΕΙΟΥ ΑΛΓΕΒΡΑ

21.14 1)

$$2\eta\mu^3x - 5\sigma\upsilon\nu^2x - 4\eta\mu x + 2 = 0 \xRightarrow{\sigma\upsilon\nu^2x=1-\eta\mu^2x} 2\eta\mu^3x - 5(1-\eta\mu^2x) - 4\eta\mu x + 2 = 0 \Rightarrow$$

$$\Rightarrow 2\eta\mu^3x - 5 + 5\eta\mu^2x - 4\eta\mu x + 2 = 0 \Rightarrow 2\eta\mu^3x + 5\eta\mu^2x - 4\eta\mu x - 3 = 0 \xRightarrow{\theta\acute{\epsilon}\tau\omicron\upsilon\mu\epsilon\ y=\eta\mu x} 2y^3 + 5y^2 - 4y - 3 = 0$$

$$\text{παραγοντοποιούμε το } 2y^3 + 5y^2 - 4y - 3 \text{ με σχήμα Horner (ρίζα το 1):}$$

2	5	-4	-3	1
	2	7	3	
2	7	3	0	

$$\text{Άρα } 2y^3 + 5y^2 - 4y - 3 = 0 \Rightarrow (y-1)(2y^2 + 7y + 3) = 0 \xRightarrow{2y^2+7y+3=(2y+1)(y+3)} (y-1)(2y+1)(y+3) = 0 \Rightarrow$$

$$\xRightarrow{y=\eta\mu x} (\eta\mu x - 1)(2\eta\mu x + 1)(\eta\mu x + 3) = 0 \Rightarrow$$

$$\Rightarrow \eta\mu x - 1 = 0 \Rightarrow$$

$$\Rightarrow \eta\mu x = 1 \Rightarrow \eta\mu x = \eta\mu \frac{\pi}{2} \Rightarrow$$

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

$$\text{ή } 2\eta\mu x + 1 = 0 \Rightarrow$$

$$\Rightarrow \eta\mu x = -\frac{1}{2} \Rightarrow \eta\mu x = \eta\mu \left(-\frac{\pi}{6}\right) \Rightarrow$$

$$\Rightarrow x = 2\kappa\pi - \frac{\pi}{6} \text{ ή } x = 2\kappa\pi + \frac{5\pi}{6}, \kappa \in \mathbb{Z}$$

$$\text{ή } \eta\mu x + 3 = 0 \Rightarrow$$

$$\Rightarrow \eta\mu x = -3$$

αδύνατη

21.14 2)

$$\eta\mu^3x + 2\eta\mu^2x - \eta\mu x - 2 = 0 \xRightarrow{\theta\acute{\epsilon}\tau\omicron\upsilon\mu\epsilon\ y=\eta\mu x} y^3 + 2y^2 - y - 2 = 0$$

Παραγοντοποιούμε το $y^3 + 2y^2 - y - 2$ με σχήμα Horner (ρίζα 1)

1	2	-1	-2	1
	1	3	2	
1	3	2	0	

$$\text{Άρα: } y^3 + 2y^2 - y - 2 = 0 \Rightarrow (y-1)(y^2 + 3y + 2) = 0 \xRightarrow{\Delta < 0} (y-1) = 0 \Rightarrow y = 1 \Rightarrow$$

$$\xRightarrow{y=\eta\mu x} \eta\mu x = 1 \Rightarrow \eta\mu x = \eta\mu \frac{\pi}{2} \Rightarrow x = 2\kappa\pi + \frac{\pi}{2}, \kappa \in \mathbb{Z}$$

21.14 3)

$$2\sigma\upsilon\nu^3x + 4\eta\mu^2x - \sigma\upsilon\nu x - 2 = 0 \xRightarrow{\theta\acute{\epsilon}\tau\omicron\upsilon\mu\epsilon\ \eta\mu^2x=1-\sigma\upsilon\nu^2x} 2\sigma\upsilon\nu^3x + 4(1-\sigma\upsilon\nu^2x) - \sigma\upsilon\nu x - 2 = 0 \Rightarrow$$

$$\Rightarrow 2\sigma\upsilon\nu^3x + 4 - 4\sigma\upsilon\nu^2x - \sigma\upsilon\nu x - 2 = 0 \Rightarrow$$

$$\Rightarrow 2\sigma\upsilon\nu^3x - 4\sigma\upsilon\nu^2x - \sigma\upsilon\nu x + 2 = 0 \xRightarrow{\theta\acute{\epsilon}\tau\omicron\upsilon\mu\epsilon\ y=\sigma\upsilon\nu x} 2y^3 - 4y^2 - y + 2 = 0$$

Παραγοντοποιούμε το $2y^3 - 4y^2 - y + 2$ με σχήμα Horner (ρίζα 2)

2	-4	-1	2	2
	4	0	-2	
2	0	-1	0	

$$\text{Άρα: } 2y^3 - 4y^2 - y + 2 = 0 \Rightarrow (y-2)(2y^2 - 1) = 0 \xRightarrow{y=\sigma\upsilon\nu x} (\sigma\upsilon\nu x - 2)(2\sigma\upsilon\nu^2x - 1) = 0 \Rightarrow$$

$$2\sigma\upsilon\nu^2\chi-1=0$$

$$\Rightarrow \sigma\upsilon\nu^2\chi=\frac{1}{2}$$

$$\Rightarrow \sigma\upsilon\nu\chi-2=0$$

$$\Rightarrow \sigma\upsilon\nu\chi=2 \quad \text{αδύνατη}$$

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$$\Rightarrow \sigma\upsilon\nu\chi=\frac{\sqrt{2}}{2} \quad \text{ή} \quad \sigma\upsilon\nu\chi=-\frac{\sqrt{2}}{2}$$

$$\Rightarrow \sigma\upsilon\nu\chi=\sigma\upsilon\nu\frac{\pi}{4} \quad \text{ή} \quad \sigma\upsilon\nu\chi=\sigma\upsilon\nu\frac{3\pi}{4}$$

$$\Rightarrow \chi=2\kappa\pi+\frac{\pi}{4} \quad \text{ή} \quad \chi=2\kappa\pi+\frac{3\pi}{4}, \quad \kappa\in Z$$