

Β ΛΥΚΕΙΟΥ ΑΛΓΕΒΡΑ

21.3 1)

$$\begin{aligned}x^3 - 3x^2 - 4x + 12 = 0 &\Rightarrow x^2(x-3) - 4(x-3) = 0 \Rightarrow (x-3)(x^2 - 4) = 0 \Rightarrow \\&\Rightarrow (x-3)(x-2)(x+2) = 0 \Rightarrow \\&\Rightarrow x-3=0 & \text{||| } x-2=0 \Rightarrow & \text{||| } x+2=0 \Rightarrow \\&\Rightarrow x=3 & \Rightarrow x=2 & \Rightarrow x=-2\end{aligned}$$

21.3 2)

$$\begin{aligned}x^3 + 2x^2 + 3x + 6 = 0 &\Rightarrow x(x^2 + 3) + 2(x^2 + 3) = 0 \Rightarrow \\&\Rightarrow (x^2 + 3)(x + 2) = 0 \Rightarrow x^2 + 3 = 0 \dots\dots \text{αδύνατη} \\&\text{||| } x+2=0 \Rightarrow x=-2\end{aligned}$$

21.3 3)

$$\begin{aligned}2x^3 + 8x^2 - 6x - 24 = 0 &\Rightarrow 2x(x^2 - 3) + 8(x^2 - 3) = 0 \Rightarrow (x^2 - 3)(2x + 8) = 0 \Rightarrow \\&\Rightarrow x^2 - 3 = 0 & \Rightarrow 2x + 8 = 0 \\&\Rightarrow x^2 = 3 & \text{||| } \Rightarrow 2x = -8 \\&\Rightarrow x = \pm\sqrt{3} & \Rightarrow x = -4\end{aligned}$$

21.3 4)

$$\begin{aligned}x^5 + 4x^2 = 4x^3 + x^4 &\Rightarrow x^5 + 4x^2 - 4x^3 - x^4 = 0 \Rightarrow \\&\Rightarrow x^4(x-1) - 4x^2(x-1) = 0 \Rightarrow (x-1)(x^4 - 4x^2) = 0 \Rightarrow \\&\Rightarrow (x-1) \cdot x^2 \cdot (x^2 - 4) = 0 \Rightarrow \\&\Rightarrow x-1=0 & \Rightarrow x^2=0 & \text{||| } \Rightarrow x^2-4=0 \\&\Rightarrow x=1 & \Rightarrow x=0 & \Rightarrow x=\pm 2\end{aligned}$$

21.3 5)

$$\begin{aligned}2x^5 + 9x^2 = x^4 + 18x^3 &\Rightarrow 2x^5 - x^4 - 18x^3 + 9x^2 = 0 \Rightarrow \\&\Rightarrow x^4(2x-1) - 9x^2(2x-1) = 0 \Rightarrow (2x-1)(x^4 - 9x^2) = 0 \Rightarrow \\&\Rightarrow (2x-1) \cdot x^2 \cdot (x^2 - 9) = 0 \Rightarrow \\&\Rightarrow 2x-1=0 & \Rightarrow x^2=0 & \text{||| } \Rightarrow x^2-9=0 \\&\Rightarrow x=\frac{1}{2} & \Rightarrow x=0 & \Rightarrow x=\pm 3\end{aligned}$$