16.15 1)

$$1+2\sigma\upsilon\nu x-\eta\mu x=2\eta\mu x\sigma\upsilon\nu x \Leftrightarrow 1+2\sigma\upsilon\nu x-\eta\mu x-2\eta\mu x\sigma\upsilon\nu x=0 \Leftrightarrow$$
$$\Leftrightarrow 1+2\sigma\upsilon\nu x-\eta\mu x(1+2\sigma\upsilon\nu x)=0 \Leftrightarrow (1+2\sigma\upsilon\nu x)(1-\eta\mu x)=0 \Leftrightarrow$$

$$\Leftrightarrow 1+2\sigma\upsilon\nu x=0 \Leftrightarrow$$
$$\Leftrightarrow 2\sigma\upsilon\nu x=-1 \Rightarrow \sigma\upsilon\nu x=-\frac{1}{2} \Leftrightarrow$$
$$\Leftrightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu\left(\pi-\frac{\pi}{3}\right) \Leftrightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu\frac{2\pi}{3} \Leftrightarrow$$
$$\Leftrightarrow x=2\kappa\pi+\frac{2\pi}{3} \text{ ή } x=2\kappa\pi-\frac{2\pi}{3},\ \kappa\in Z$$

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$$1-\eta\mu x=0 \Leftrightarrow$$
$$\Rightarrow \eta\mu x=1 \Rightarrow \eta\mu x=\eta\mu\frac{\pi}{2} \Rightarrow$$
$$\Rightarrow x=2\kappa\pi+\frac{\pi}{2} \text{ ή } x=2\kappa\pi+\pi-\frac{\pi}{2}=2\kappa\pi+\frac{\pi}{2},\ \kappa\in Z$$

16.15 2)

$$4\eta\mu x\cdot\sigma\upsilon\nu x-2\eta\mu x-2\sigma\upsilon\nu x+1=0 \Rightarrow 2\eta\mu x(2\sigma\upsilon\nu x-1)-2\sigma\upsilon\nu x+1=0 \Rightarrow$$

$$\Rightarrow (2\sigma\upsilon\nu x-1)(2\eta\mu x-1)=0 \Rightarrow$$

$$2\sigma\upsilon\nu x-1=0$$
$$\Rightarrow 2\sigma\upsilon\nu x=1$$
$$\Rightarrow \sigma\upsilon\nu x=\frac{1}{2}$$
$$\Rightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu\frac{\pi}{3}$$
$$\Rightarrow x=2\kappa\pi\pm\frac{\pi}{3},\ \kappa\in Z$$

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$$2\eta\mu x-1=0$$
$$\Rightarrow 2\eta\mu x=1$$
$$\Rightarrow \eta\mu x=\frac{1}{2}$$
$$\Rightarrow \eta\mu x=\eta\mu\frac{\pi}{6}$$
$$\Rightarrow x=2\kappa\pi+\frac{\pi}{6}$$
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$$x=2\kappa\pi+\frac{5\pi}{6},\ \kappa\in Z$$

16.15 3)

$$\sigma\varphi x\cdot\sigma\upsilon\nu x+1=\sigma\upsilon\nu x+\sigma\varphi x \Rightarrow \sigma\varphi x\cdot\sigma\upsilon\nu x+1-\sigma\upsilon\nu x-\sigma\varphi x=0 \Rightarrow$$

$$\Rightarrow \sigma\varphi x(\sigma\upsilon\nu x-1)+1-\sigma\upsilon\nu x=0 \Rightarrow (\sigma\upsilon\nu x-1)(\sigma\varphi x-1)=0 \Rightarrow$$

$$\Rightarrow \sigma\upsilon\nu x-1=0$$
$$\Rightarrow \sigma\upsilon\nu x=1$$
$$\Rightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu 0$$
$$\Rightarrow x=2\kappa\pi,\ \kappa\in Z$$
απορρίπτεται γιατί η $\sigma\varphi x$ δεν ορίζεται για $x=\kappa\pi,\ \kappa\in Z$

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$$\Rightarrow \sigma\varphi x-1=0$$
$$\Rightarrow \sigma\varphi x=1$$
$$\Rightarrow \sigma\varphi x=\sigma\varphi\frac{\pi}{4}$$
$$\Rightarrow x=\kappa\pi+\frac{\pi}{4},\ \kappa\in Z$$

16.15 4)

$$\eta\mu x+\varepsilon\varphi x=1+\eta\mu x\cdot\varepsilon\varphi x\Rightarrow \eta\mu x+\varepsilon\varphi x-1-\eta\mu x\cdot\varepsilon\varphi x=0\Rightarrow$$

$$\Rightarrow \eta\mu x\left(1-\varepsilon\varphi x\right)+\varepsilon\varphi x-1=0\Rightarrow\left(1-\varepsilon\varphi x\right)\left(\eta\mu x-1\right)=0\Rightarrow$$

$\varepsilon\varphi x=1$

$\Rightarrow \varepsilon\varphi x=\varepsilon\varphi\dfrac{\pi}{4}$

$\Rightarrow x=\kappa\pi+\dfrac{\pi}{4}\ ,\ \kappa\in Z$

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$\Rightarrow \eta\mu x=1$

$\Rightarrow \eta\mu x=\eta\mu\dfrac{\pi}{2}$

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

απορρίπτεται γιατί η εφx δεν ορίζεται για $x=2\kappa\pi+\dfrac{\pi}{2}\ ,\ \kappa\in Z$

16.15 5)

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

$$\Rightarrow \sigma\upsilon\nu x\left(\sigma\upsilon\nu^2x-1\right)-2\left(\sigma\upsilon\nu^2x-1\right)=0\Rightarrow\left(\sigma\upsilon\nu^2x-1\right)\left(\sigma\upsilon\nu x-2\right)=0\Rightarrow$$

$$\Rightarrow\left(\sigma\upsilon\nu x-1\right)\left(\sigma\upsilon\nu x+1\right)\left(\sigma\upsilon\nu x-2\right)=0\Rightarrow$$

$\Rightarrow \sigma\upsilon\nu^2x=1$

$\Rightarrow \sigma\upsilon\nu x=1$

$\Rightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu 0$

$\Rightarrow x=2\kappa\pi$

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$\sigma\upsilon\nu x=-1$

$\Rightarrow \sigma\upsilon\nu x=\sigma\upsilon\nu\pi$

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

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$\Rightarrow \sigma\upsilon\nu x=2$

$\Rightarrow$ αδύνατη

Συνοψίζοντας τις παραπάνω λύσεις έχουμε $x=\kappa\pi\ \ ,\ \kappa\in Z$