Εκφώνηση 10

2. ⓐ $\varepsilon\varphi x = -\frac{3}{4}$

$\sigma\varphi x = -\frac{4}{3}$

$\frac{1}{2} < x < 1$

$$\sigma\upsilon\nu^2 x = \frac{1}{1+\varepsilon\varphi^2 x} = \frac{1}{1+\left(-\frac{3}{4}\right)^2} = \frac{1}{1+\frac{9}{16}} = \frac{1}{\frac{25}{16}}$$

$$\sigma\upsilon\nu^2 x = \frac{16}{25}$$

$\sigma\upsilon\nu x = \frac{4}{5}$ ή $\sigma\upsilon\nu x = -\frac{4}{5}$

$$\eta\mu^2 x + \sigma\upsilon\nu^2 x = 1$$

$$\eta\mu^2 x + \frac{16}{25} = 1$$

$$\eta\mu^2 x = \frac{9}{25}$$

$\eta\mu x = \frac{3}{5}$ ή $\eta\mu x = -\frac{3}{5}$.

Προβοχι στις δυο παρακατω εφαρμογες.

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1. Αν $2\sigma\upsilon\nu^2 x + 5\eta\mu x - 4 = 0$

και $0 < x < \frac{\pi}{2}$

Να βρεθουν τα $\eta\mu x$, $\sigma\upsilon\nu x$, $\sigma\varphi x$.

Γνωριζω οτι $\eta\mu^2 x + \sigma\upsilon\nu^2 x = 1$

$\sigma\upsilon\nu^2 x = 1 - \eta\mu^2 x$

$2(1 - \eta\mu^2 x) + 5\eta\mu x - 4 = 0$

$2 - 2\eta\mu^2 x + 5\eta\mu x - 4 = 0$

$-2\eta\mu^2 x + 5\eta\mu x - 2 = 0$

$\eta\mu x = t$

$$-2t^2 + 5t - 2 = 0$$

$$\Delta = 25 - 4(-2)(-2)$$

$$\Delta = 25 - 16 = 9$$

$$t = \frac{-5 \pm 3}{-4} \quad \begin{cases} \frac{1}{2} \\ 2 \end{cases}$$

$t = \frac{1}{2}$ i $t = 2$

$\sin x = \frac{1}{2}$

$\sin x = 2$

$\sin^2 x + \cos^2 x = 1$

$\frac{1}{4} + \cos^2 x = 1$

$\cos^2 x = \frac{3}{4}$

$\cos x = \frac{\sqrt{3}}{2}$ i $\cos x = -\frac{\sqrt{3}}{2}$

$$\operatorname{tg} x = \frac{\sin x}{\cos x} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$$

$\operatorname{tg} x = \frac{1}{\sqrt{3}}$

$\operatorname{ctg} x = \frac{\sqrt{3}}{1}$

2. Αν $\varepsilon\varphi x = 9\,\delta\varphi x$ και

Βρ. $\eta\mu x, \sigma\upsilon\nu x, \varepsilon\varphi x, \delta\varphi x$ $\frac{\pi}{2} < x < \pi$

Γνωρίζω ότι $\varepsilon\varphi x = \frac{1}{\delta\varphi x}$

$$\frac{1}{\delta\varphi x} = 9\,\delta\varphi x$$

$$\frac{1}{9} = \delta\varphi^2 x$$

$\delta\varphi x = \frac{1}{3}$ ή $\delta\varphi x = -\frac{1}{3}$

$\varepsilon\varphi x = -3$

$$\sigma\upsilon\nu^2 x = \frac{1}{1+\varepsilon\varphi^2 x} = \frac{1}{1+9} = \frac{1}{10}$$

$$\sigma\upsilon\nu x = \frac{1}{\sqrt{10}} \text{ ή } \sigma\upsilon\nu x = -\frac{1}{\sqrt{10}}$$

$$\varepsilon\varphi x = \frac{\eta\mu x}{\sigma\upsilon\nu x} \Rightarrow -3 = \frac{\eta\mu x}{-\frac{1}{\sqrt{10}}}$$

$$\eta\mu x = \frac{3}{\sqrt{10}}$$

Пробоки

Ъглови ъгли x ω ∈ ℝ

$\text{пр}\, x = \frac{2}{3}$ и $\text{ов}\, x = \frac{1}{2}$!

Проси $\text{пр}^2 x + \text{ов}^2 x = 1$

$$\left(\frac{2}{3}\right)^2 + \left(\frac{1}{2}\right)^2 = 1$$

$$\frac{4}{9} + \frac{1}{4} = 1$$

$$\frac{16}{36} + \frac{9}{36} = 1$$

ОХ!

$$\frac{25}{36} \neq 1$$

2 # Αποδείξεις

1. Να δ.ο $\frac{\eta\mu x}{1+\sigma\upsilon\nu x} + \frac{1+\sigma\upsilon\nu x}{\eta\mu x} = \frac{2}{\eta\mu x}$

$\epsilon\kappa\pi: (1+\sigma\upsilon\nu x)\eta\mu x$

$$(1+\sigma\upsilon\nu x)\eta\mu x \frac{\eta\mu x}{1+\sigma\upsilon\nu x} + (1+\sigma\upsilon\nu x)\eta\mu x \frac{1+\sigma\upsilon\nu x}{\eta\mu x} =$$

$$= (1+\sigma\upsilon\nu x)\eta\mu x \frac{2}{\eta\mu x}$$

$$\eta\mu^2 x + (1+\sigma\upsilon\nu x)^2 = 2(1+\sigma\upsilon\nu x)$$

$$\eta\mu^2 x + 1 + 2\sigma\upsilon\nu x + \sigma\upsilon\nu^2 x = 2 + 2\sigma\upsilon\nu x$$

$$\eta\mu^2 x + \sigma\upsilon\nu^2 x + 1 = 2$$

$$1 + 1 = 2 \quad \checkmark$$

2. Nb $\frac{\cos\theta}{1+\operatorname{ctg}\theta} - \frac{\sin\theta}{1+\operatorname{tg}\theta} = \cos\theta - \sin\theta$.

$$\frac{\cos\theta}{1+\frac{\sin\theta}{\cos\theta}} - \frac{\sin\theta}{1+\frac{\cos\theta}{\sin\theta}} = \cos\theta - \sin\theta$$

$$\frac{\cos\theta}{\frac{\cos\theta}{\cos\theta}+\frac{\sin\theta}{\cos\theta}} - \frac{\sin\theta}{\frac{\sin\theta}{\sin\theta}+\frac{\cos\theta}{\sin\theta}} = \cos\theta - \sin\theta$$

$$\frac{\frac{\cos\theta}{1}}{\frac{\cos\theta+\sin\theta}{\cos\theta}} - \frac{\frac{\sin\theta}{1}}{\frac{\sin\theta+\cos\theta}{\sin\theta}} = \cos\theta - \sin\theta$$

$$\frac{\cos^2\theta}{\cos\theta+\sin\theta} - \frac{\sin^2\theta}{\sin\theta+\cos\theta} = \cos\theta - \sin\theta.$$

$$\frac{\cos^2\theta - \sin^2\theta}{\cos\theta+\sin\theta} = \cos\theta - \sin\theta$$

$$\frac{(\sin\theta - \cos\theta)(\sin\theta + \cos\theta)}{\sin\theta + \cos\theta} = \sin\theta - \cos\theta$$

$$\sin\theta - \cos\theta = \sin\theta - \cos\theta$$

$$\theta = \theta.$$

3. Νδο $\eta\mu^2\alpha\,\sigma\upsilon\nu^2\beta + \sigma\upsilon\nu^2\alpha = 1 - \eta\mu^2\alpha\,\eta\mu^2\beta$.

$$\eta\mu^2\alpha\,\sigma\upsilon\nu^2\beta + \eta\mu^2\alpha\,\eta\mu^2\beta = 1 - \sigma\upsilon\nu^2\alpha$$

$$\eta\mu^2\alpha\left(\sigma\upsilon\nu^2\beta + \eta\mu^2\beta\right) = 1 - \sigma\upsilon\nu^2\alpha$$

$$\eta\mu^2\alpha \cdot 1 + \sigma\upsilon\nu^2\alpha = 1$$

$$\eta\mu^2\alpha + \sigma\upsilon\nu^2\alpha = 1$$ ✓

5. Να δ.ο $-5 \le 3\eta\mu x + 4\sigma\upsilon\nu x \le 5$.

$$|3\eta\mu x + 4\sigma\upsilon\nu x| \le 5$$

$$(3\eta\mu x + 4\sigma\upsilon\nu x)^2 \le 25$$

$$9\eta\mu^2 x + 24\eta\mu x\sigma\upsilon\nu x + 16\sigma\upsilon\nu^2 x \le 25$$

$$9(1-\sigma\upsilon\nu^2 x) + 24\eta\mu x\sigma\upsilon\nu x + 16(1-\eta\mu^2 x) \le 25$$

$$9 - 9\sigma\upsilon\nu^2 x + 24\eta\mu x\sigma\upsilon\nu x + 16 - 16\eta\mu^2 x \le 25$$

$$-9\sigma\upsilon\nu^2 x + 24\eta\mu x\sigma\upsilon\nu x - 16\eta\mu^2 x \le 0$$

$$9\sigma\upsilon\nu^2 x - 24\eta\mu x\sigma\upsilon\nu x + 16\eta\mu^2 x \ge 0$$

$$(3\sigma\upsilon\nu x - 4\eta\mu\nu)^2 \ge 0$$

4. $N\int_0 (n\mu x + \sigma w x)^2 \leq 2$

$n\mu^2 x + 2n\mu x \sigma w x + \sigma w^2 x \leq 2$

$1 + 2n\mu x \sigma w x \leq 2$

$2n\mu x \sigma w x \leq 1.$

$2n\mu x \sigma w x \leq n\mu^2 x + \sigma w^2 x$

$0 \leq n\mu^2 x - 2n\mu x \sigma w x + \sigma w^2 x$

$0 \leq (n\mu x - \sigma w x)^2$

Επόμενο μάθημα

Ημερομηνία μαθήματος : Παρασκευή 23/10

Ώρα μαθήματος : 21:30

Ασκήσεις

Ενότητα 10

Σελ 123

3

4

5

6

7

8

10 α

11 ολη

14 ολη

17

18

παρατηρήσεις