24.

$$\frac{1+\sigma\varphi^5 x}{1+\varepsilon\varphi^5 x} = \left(\frac{1+\sigma\varphi x}{1+\varepsilon\varphi x}\right)^5$$

$$\frac{1+\dfrac{\sigma\upsilon\nu^5 x}{\eta\mu^5 x}}{1+\dfrac{\eta\mu^5 x}{\sigma\upsilon\nu^5 x}} = \left(\frac{1+\dfrac{\sigma\upsilon\nu x}{\eta\mu x}}{1+\dfrac{\eta\mu x}{\sigma\upsilon\nu x}}\right)^5$$

$$\frac{\dfrac{\cancel{\eta\mu^5 x+\sigma\upsilon\nu^5 x}}{\eta\mu^5 x}}{\dfrac{\cancel{\sigma\upsilon\nu^5 x+\eta\mu^5 x}}{\sigma\upsilon\nu^5 x}} = \left(\frac{\dfrac{\cancel{\eta\mu x+\sigma\upsilon\nu x}}{\eta\mu x}}{\dfrac{\cancel{\sigma\upsilon\nu x+\eta\mu x}}{\sigma\upsilon\nu x}}\right)^5$$

$$\frac{\sigma\upsilon\nu^5 x}{\eta\mu^5 x} = \left(\frac{\sigma\upsilon\nu x}{\eta\mu x}\right)^5$$ ✓

23. (B). $\varepsilon\varphi\omega = \frac{2k}{k+5}$ $\quad\sigma\varphi\omega = \frac{4k}{5-k}$.

$$\varepsilon\varphi\omega \cdot \sigma\varphi\omega = 1$$

$$\frac{2k}{k+5} \cdot \frac{4k}{5-k} = 1$$

$$\frac{8k^2}{5^2-k^2} = 1 \Rightarrow 8k^2 = 25 - k^2$$

$$9k^2 = 25$$

$$k = \frac{\pm 5}{3}$$

22. ⑧ $\cos x + \sqrt{3}\sin x = 2 \Rightarrow \cos x = 2 - \sqrt{3}\sin x$

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

$\sin^2 x + (2 - \sqrt{3}\sin x)^2 = 1$

$\sin^2 x + 4 - 4\sqrt{3}\sin x + 3\sin^2 x = 1$

$4\sin^2 x - 4\sqrt{3}\sin x + 4 = 1$

$4\sin^2 x - 4\sqrt{3}\sin x + 3 = 0$

$(2\sin x - \sqrt{3})^2 = 0$

$2\sin x - \sqrt{3} = 0$

$\sin x = \frac{\sqrt{3}}{2}$

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

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

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

29. Av $0 \le x \le \frac{\pi}{2}$

$$\frac{\left(\sqrt{1-\sin x}-\sqrt{1+\sin x}\right)\left(\sqrt{1-\sin x}-\sqrt{1+\sin x}\right)}{\left(\sqrt{1-\sin x}+\sqrt{1+\sin x}\right)\left(\sqrt{1-\sin x}-\sqrt{1+\sin x}\right)} =$$

$$= \frac{\left(\sqrt{1-\sin x}-\sqrt{1+\sin x}\right)^2}{\sqrt{1-\sin x}^2-\sqrt{1+\sin x}^2} =$$

$$= \frac{1-\sin x - 2\sqrt{1-\sin x}\sqrt{1+\sin x}+1+\sin x}{1-\sin x-1-\sin x} =$$

$$= \frac{2-2\sqrt{1-\sin x}\sqrt{1+\sin x}}{-2\sin x} = \frac{1-\sqrt{(1-\sin x)(1+\sin x)}}{-\sin x}.$$

$$= \frac{1-\sqrt{1-\sigma w^2 x}}{-\sigma w x} = \frac{1-\sqrt{\mu r^2 x}}{-\sigma w x}$$

$$= \frac{1-\overset{\oplus}{|\mu r x|}}{-\sigma w x} = \frac{1-\mu r x}{-\sigma w x} = \frac{\mu r x - 1}{\sigma w x}$$

27. (B) $\sqrt{ημ^4θ+6συν^2θ+3}+\sqrt{συν^4θ+6ημ^2θ+3}=5$

$$\sqrt{ημ^4θ+6(1-ημ^2θ)+3}+\sqrt{συν^4θ+6(1-συν^2θ)+3}=5$$

$$\sqrt{ημ^4θ-6ημ^2θ+9}+\sqrt{συν^4θ-6συν^2θ+9}=5$$

$$\sqrt{(ημ^2θ-3)^2}+\sqrt{(συν^2θ-3)^2}=5$$

⊖ ⊖

$$|ημ^2θ-3|+|συν^2θ-3|=5$$

$-1 \le ημθ \le 1$

$|ημθ| \le 1$

$|ημθ|^2 \le 1$

$ημ^2θ < 3$

$ημ^2θ-3<0$

όμοια,

$$-\eta\mu^2\theta + 3 \quad - \sigma\upsilon\nu^2\theta + 3 = 5$$

$$-\eta\mu^2\theta \quad - \sigma\upsilon\nu^2\theta + 6 = 5$$

$$6 - 5 = \eta\mu^2\theta + \sigma\upsilon\nu^2\theta$$

$$1 = 1 \quad \checkmark$$

21. (B) $\frac{\sin 3x}{\cos x} + \frac{\operatorname{tg} x}{1+\operatorname{tg}^2 x} = \operatorname{tg} x$

$$\frac{\sin^3 x}{\cos x} + \frac{1}{\operatorname{tg} x} \cdot \frac{\operatorname{tg}^2 x}{1+\operatorname{tg}^2 x} = \operatorname{tg} x.$$

$$\frac{\sin 3x}{\cos x} + \frac{1}{\frac{\cos x}{\sin x}} \cdot \cos^2 x = \frac{\sin x}{\cos x}$$

$$\frac{\sin 3x}{\cos x} + \frac{\sin x}{\cos x} \cos^2 x = \frac{\sin x}{\cos x}$$

$$\sin 3x + \sin x \cos^2 x = \sin x$$

$$\sin x \left(\sin^2 x + \cos^2 x \right) = \sin x$$

$$\sin x = \sin x$$

18. Nδo $\dfrac{\eta\mu x}{1+\sigma\psi x} - \dfrac{\sigma\omega x}{1+c\psi x} = \eta\mu x - \sigma\omega x$

$$\frac{\eta\mu x}{1+\dfrac{\sigma\omega x}{\eta\mu x}} - \frac{\sigma\omega x}{1+\dfrac{\eta\mu x}{\sigma\omega x}} = \eta\mu x - \sigma\omega x$$

$$\frac{\eta\mu x}{\dfrac{\eta\mu x+\sigma\omega x}{\eta\mu x}} - \frac{\sigma\omega x}{\dfrac{\sigma\omega x+\eta\mu x}{\sigma\omega x}} = \eta\mu x - \sigma\omega x ,$$

$$\frac{\eta\mu^2 x}{\eta\mu x+\sigma\omega x} - \frac{\sigma\omega^2 x}{\sigma\omega x+\eta\mu x} = \eta\mu x - \sigma\omega x$$

$$\eta\mu^2 x - \sigma\omega^2 x = (\eta\mu x-\sigma\omega x)(\sigma\omega x+\eta\mu x)$$

$$\eta\mu^2 x - \sigma\omega^2 x = \eta\mu^2 x - \sigma\omega^2 x$$

$$0 = 0 ,$$

16. (B) $\varepsilon\psi^2 x + \delta\psi^2 x + 2 = \dfrac{1}{\eta\rho^2 x \, \sigma\omega^2 x}$

$$\frac{\eta\rho^2 x}{\sigma\omega^2 x} + \frac{\sigma\omega^2 x}{\eta\rho^2 x} + 2 = \frac{1}{\eta\rho^2 x \, \sigma\omega^2 x}$$

Ekv. $\eta\rho^2 x \sigma\omega^2 x$

$$\eta\rho^4 x + \sigma\omega^4 x + 2\eta\rho^2 x \sigma\omega^2 x = 1$$

$$\left(\eta\rho^2 x + \sigma\omega^2 x\right)^2 = 1$$

$$1^2 = 1$$

$$1 = 1.$$

14. (β) $\frac{\eta\mu\alpha}{1+\sigma\upsilon\nu\alpha} + \frac{\eta\mu\alpha}{1-\sigma\upsilon\nu\alpha} = \frac{2}{\eta\mu\alpha}$

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

$$\frac{\eta\mu\alpha - \eta\mu\alpha\sigma\upsilon\nu\alpha + \eta\mu\alpha + \eta\mu\alpha\sigma\upsilon\nu\alpha}{1-\sigma\upsilon\nu^2\alpha} = \frac{2}{\eta\mu\alpha}$$

$$\frac{2\eta\mu\alpha}{\eta\mu^2\alpha} = \frac{2}{\eta\mu\alpha}$$

$$\frac{2}{\eta\mu\alpha} = \frac{2}{\eta\mu\alpha}.$$

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

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

11. (B) $(n\mu x + \sigma w x)(n\mu x - \sigma w x) + 2\sigma w^2 x = 1$

$$n\mu^2 x - \sigma w^2 x + 2\sigma w^2 x = 1$$

$$n\mu^2 x + \sigma w^2 x = 1$$ ✓

12. (A) $$\frac{\sigma w^2 a - \sigma w^2 B}{n\mu^2 a - n\mu^2 B} = -1$$

$$\sigma w^2 a - \sigma w^2 B = -n\mu^2 a + n\mu^2 B$$

$$\sigma w^2 a + n\mu^2 a = n\mu^2 B + \sigma w^2 B$$

$$1 = 1.$$

10. Β) Να δείξετε ότι $\dfrac{\sqrt{2}\sigma\upsilon\nu x - 1}{\eta\mu x + \sigma\upsilon\nu x} = \dfrac{\sigma\upsilon\nu x - \eta\mu x}{\sqrt{2}\,\sigma\upsilon\nu x + 1}$

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

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

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

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

9. (B) $x = 2\eta\mu\vartheta\sigma\omega\varphi$

$y = 2\eta\mu\vartheta\eta\mu\varphi$

$z = 2\sigma\omega\vartheta$

ΝΔΟ $x^2 + y^2 + z^2 = 4$

$$(2\eta\mu\vartheta\sigma\omega\varphi)^2 + (2\eta\mu\vartheta\eta\mu\varphi)^2 + (2\sigma\omega\vartheta)^2 = 4$$

$$4\eta\mu^2\vartheta\sigma\omega^2\varphi + 4.\eta\mu^2\vartheta\eta\mu^2\varphi + 4\sigma\omega^2\vartheta = 4$$

$$\eta\mu^2\vartheta\sigma\omega^2\varphi + \eta\mu^2\vartheta\eta\mu^2\varphi + \sigma\omega^2\vartheta = 1$$

$$\eta\mu^2\vartheta(\sigma\omega^2\varphi + \eta\mu^2\varphi) + \sigma\omega^2\vartheta = 1$$

$$\eta\mu^2\vartheta \cdot \underline{1} + \sigma\omega^2\vartheta = 1$$

$$\underline{1 = 1}.$$

Втора задача

10

(1) α

(2) α

(3) .

(5) α .

(6)

(8) α γ

(9) α

(10) α

(11) α

(12) α β .

(14) α

(15)

(16) α

(17) .

(19) .

(20)

(21) α .

(22) α

(23) α .