

الف) $1 - 2\delta^2 \alpha = 2\delta \alpha - 1 \rightarrow \delta \alpha \begin{cases} -2 & \text{غیر} \\ +1/2 & \text{قد} \end{cases} \rightarrow \alpha = 2k\pi + \pi/4$
 $\alpha = 2k\pi + \pi - \pi/4$

ب) $2\delta^2 \alpha - 1 + \alpha - 2 = 0 \rightarrow 2\delta^2 \alpha + \alpha - 3 = 0$
 $\alpha = 2k\pi$

الف) $-\delta \alpha = \delta \alpha \rightarrow \delta \alpha = \delta \alpha \rightarrow \delta \alpha = \delta \alpha (\pi/2 + \pi/4)$
 $\pi \alpha + \pi/2 = \begin{cases} 2k\pi + \pi/2 \rightarrow \alpha = k\pi - \pi/4 \\ 2k\pi - \pi/2 \rightarrow \alpha = \frac{k\pi}{2} - \pi/4 \end{cases}$
 جواب $2\alpha = k\pi - \pi/2$
 $\alpha = \frac{k\pi}{2} - \pi/4$
 ب) $2\delta^2 \alpha + \delta \alpha = \delta^2 \alpha + \delta \alpha \rightarrow \delta \alpha = -\delta \alpha \rightarrow \delta \alpha = -1$
 جواب $\alpha = k\pi - \pi/2$

الف) $\frac{\delta}{\delta \alpha} (2\delta \alpha + 1) = \frac{1}{\delta \alpha} \rightarrow 2\delta^2 \alpha + \delta \alpha = 1 \rightarrow \delta \alpha \begin{cases} -1 & \text{غیر} \\ 1/2 & \text{قد} \end{cases} \rightarrow \alpha = 2k\pi \pm \pi/2$
 ب) $\frac{\delta}{\delta \alpha} (2\delta \alpha - 1) = 0 \rightarrow 2\delta^2 \alpha - \delta \alpha = 0 \rightarrow \delta \alpha (2\delta \alpha - 1) = 0$
 $2\delta \alpha - 1 = 0 \rightarrow \delta \alpha = 1/2 \rightarrow \alpha = k\pi + \pi/4$
 $2\delta \alpha - 1 = 0 \rightarrow \delta \alpha = 1/2 \rightarrow \alpha = k\pi + \pi/4$

الف) $\delta (n + \pi/4) = \delta (n + \pi/4) = 1/4 \rightarrow \delta (2n + \pi/2) = 1/4$
 $\rightarrow \delta \alpha = 1/4 \rightarrow 2n = 2k\pi + \pi/2 \rightarrow \alpha = k\pi + \pi/4$
 جواب $\alpha = k\pi + \pi/4$

$\delta (2n - \pi/4) = \delta - 2n = \delta (2n - \pi/4) = \delta (\pi/4 + 2n) \rightarrow 2n - \pi/4 = \begin{cases} 2k\pi + \pi/4 + \pi/2 \\ 2k\pi - \pi/4 - \pi/2 \end{cases}$
 ب) $2n = 2k\pi - \pi/4 \rightarrow n = k\pi - \pi/8$
 جواب $\alpha = k\pi - \pi/8$

$\frac{2\delta \alpha \delta \alpha + \delta \alpha}{\delta \alpha} - \delta \alpha = \delta \alpha \rightarrow 2\delta \alpha + 1 - \delta \alpha = \delta \alpha$

$2\delta \alpha = 0 \rightarrow 2\alpha = k\pi + \pi/4 \rightarrow \alpha = \frac{k\pi}{2} + \pi/4$
 جواب $\alpha = \frac{k\pi}{2} + \pi/4$

$$\frac{3^{\frac{\alpha}{\pi}}}{1+2^{\frac{\alpha}{\pi}}} = \frac{1+2^{\frac{\alpha}{\pi}}}{3^{\frac{\alpha}{\pi}}} \rightarrow \log \frac{\alpha}{\pi} = \log 2 + \frac{\alpha}{\pi} \rightarrow \log \frac{\alpha}{\pi} = 1 \rightarrow \log \frac{\alpha}{\pi} = \frac{1}{\pi}$$

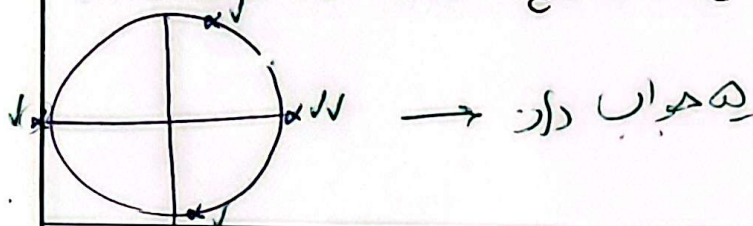
$$\frac{\alpha}{\pi} = k\pi + \frac{\pi}{\pi} \rightarrow \alpha = \begin{cases} 2k\pi + \pi & \text{برای } k \text{ زوج} \\ 2k\pi - \pi & \text{برای } k \text{ فرد} \end{cases} = \pi$$

$$|- \pi - \pi| = (2\pi) \text{ جواب}$$

$$Q^{\frac{\alpha}{\pi}} - 2^{\frac{\alpha}{\pi}} Q^{\frac{\alpha}{\pi}} = Q^{\frac{\alpha}{\pi}} + 2^{\frac{\alpha}{\pi}} \rightarrow Q^{\frac{\alpha}{\pi}} = -1$$

$$Q^{\frac{\alpha}{\pi}} = 2k\pi + \pi \rightarrow \alpha = \frac{\pi}{2} k\pi + \frac{\pi}{2}$$

$$\frac{3^{\frac{\alpha}{\pi}}}{2^{\frac{\alpha}{\pi}}} = 1 \rightarrow \alpha = k\pi$$



$$\frac{Q^{\frac{\alpha}{\pi}} - 2^{\frac{\alpha}{\pi}}}{Q^{\frac{\alpha}{\pi}} + 2^{\frac{\alpha}{\pi}}} = \frac{2^{\frac{\alpha}{\pi}}}{Q^{\frac{\alpha}{\pi}}} \rightarrow Q^{\frac{\alpha}{\pi}} Q^{\frac{\alpha}{\pi}} - Q^{\frac{\alpha}{\pi}} 2^{\frac{\alpha}{\pi}} = 2^{\frac{\alpha}{\pi}} Q^{\frac{\alpha}{\pi}} + 2^{\frac{\alpha}{\pi}} 2^{\frac{\alpha}{\pi}}$$

$$\rightarrow Q^{\frac{\alpha}{\pi}} Q^{\frac{\alpha}{\pi}} - 2^{\frac{\alpha}{\pi}} 2^{\frac{\alpha}{\pi}} = 2^{\frac{\alpha}{\pi}} Q^{\frac{\alpha}{\pi}} + 2^{\frac{\alpha}{\pi}} 2^{\frac{\alpha}{\pi}} \rightarrow Q^{\frac{\alpha}{\pi}} = 2^{\frac{\alpha}{\pi}}$$

$$\log 2^{\frac{\alpha}{\pi}} = 1 \rightarrow 2^{\frac{\alpha}{\pi}} = k\pi + \frac{\pi}{\pi} \rightarrow \alpha = \frac{k\pi}{2} + \frac{\pi}{2} \text{ جواب}$$

$$2^{\frac{\alpha}{\pi}} + Q^{\frac{\alpha}{\pi}} = \sqrt{2} Q^{\frac{\alpha}{\pi}} \rightarrow \sqrt{2} 2^{\frac{\alpha}{\pi}} (1 + \frac{Q^{\frac{\alpha}{\pi}}}{2^{\frac{\alpha}{\pi}}}) = \sqrt{2} Q^{\frac{\alpha}{\pi}}$$

$$\rightarrow Q^{\frac{\alpha}{\pi}} (2^{\frac{\alpha}{\pi}} - 1) = Q^{\frac{\alpha}{\pi}} \Rightarrow Q^{\frac{\alpha}{\pi}} (2^{\frac{\alpha}{\pi}} - 1) = Q^{\frac{\alpha}{\pi}}$$

$$\alpha - \frac{\pi}{\pi} = 2k\pi + \frac{\pi}{\pi}, \alpha - \frac{\pi}{\pi} = 2k\pi - \frac{\pi}{\pi}$$

$$\alpha = -2k\pi - \frac{\pi}{\pi} \text{ (برای جواب منفی)}, \alpha = \frac{\pi}{2} k\pi + \frac{\pi}{\pi}$$

$$\left. \begin{aligned} k=0 &\rightarrow \alpha = \frac{\pi}{2} \\ k=1 &\rightarrow \alpha = \frac{3\pi}{2} \\ k=2 &\rightarrow \alpha = \frac{5\pi}{2} \end{aligned} \right\} \text{ جواب}$$

$$\textcircled{+} \text{ در دو حالتی که به شکل } 2^{\frac{\alpha}{\pi}} + Q^{\frac{\alpha}{\pi}} = 1 \text{ هست، فقط } k=0 \text{ جواب می‌دهد.}$$

$$2^{\frac{\alpha}{\pi}} - Q^{\frac{\alpha}{\pi}} = 1 \text{ (باز)}$$

$$2^{\frac{\alpha}{\pi}} - Q^{\frac{\alpha}{\pi}} = -1$$

$$\rightarrow \text{جواب ها} = \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$

$$\rightarrow \text{جواب ها} = \left\{ 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2} \right\}$$

عنه