

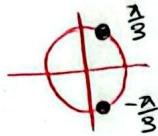
نام و نام خانوادگی مریم یعقوبی پاسخنامه تشریحی تکلیف شماره ۱۷ کلاس دوازدهم ریاضی

$$\cos \alpha = 1 + \tan^2 \alpha$$

$$\textcircled{1} \frac{1}{\cos^2 \alpha} = 1 + \tan^2 \alpha$$

$$\textcircled{1} \cos \alpha = \frac{1}{\cos^2 \alpha} \rightarrow \cos^3 \alpha = \frac{1}{\alpha} \rightarrow \cos \alpha = \frac{1}{\sqrt{3}} \rightarrow \cos \alpha = \cos \frac{\pi}{3}$$

$$\alpha = 2k\pi \pm \frac{\pi}{3}$$



رو جواب دارد ✓

✓

$$\cos^3 \alpha = 4 \cos^2 \alpha - 3 \cos \alpha \textcircled{2}$$

$$\textcircled{2} \sin^2 \alpha = 1 - \cos^2 \alpha$$

$$\textcircled{1} \textcircled{2} \text{ عبارت را بازنویسی کنیم } \omega(1 - \cos^2 \alpha) + 2(4 \cos^2 \alpha - 3 \cos \alpha) + 2 = 0 = 8 \cos^2 \alpha - \omega \cos^2 \alpha - 6 \cos \alpha + 2 = 0$$

$$\cos \alpha = t \rightarrow 8t^2 - \omega t^2 - 6t + 2 = 0$$

$$8t^2 - \omega t^2 - 6t + 2 = (t+1)(8t^2 - 13t + 2) = 0$$

رو جواب دارد ✓

$$\alpha = 2k\pi \pm \pi$$

$$2 \sin \alpha \cos \alpha + \sin \alpha = 1$$

صورت جواب است

$$\frac{\pi}{3} + \frac{\omega \pi}{3} + \frac{4\pi}{3} = \frac{\omega \pi}{3}$$

$$2 \sin \alpha (1 - 2 \sin^2 \alpha) + \sin \alpha = 1$$

جمع ضرایب جملات فرد و زوج باید برابر باشد
برای است $\sin \alpha = -1$

$$\sin \alpha = -1 \rightarrow \sin \alpha = \sin \frac{3\pi}{2} \rightarrow \alpha = 2k\pi + \frac{3\pi}{2} \rightarrow \alpha = 2k\pi + \pi - \frac{\pi}{2}$$

$$\sin \alpha = t \rightarrow 4t^3 - 3t^2 + 1 = (t+1)(2t-1)^2$$

$$\sin \alpha = \frac{1}{2} \rightarrow \sin \alpha = \sin \frac{\pi}{6}$$



$$\frac{1}{\cos^2 \alpha} - \frac{1}{\sin^2 \alpha} = 0 \rightarrow \frac{1}{\cos^2 \alpha} = \frac{1}{\sin^2 \alpha} \rightarrow \cos^2 \alpha = \sin^2 \alpha \rightarrow \cos \alpha = \pm \sin \alpha$$

$\cos \alpha \neq 0$ چون در صورتی که $\cos \alpha = 0$ پس $\sin \alpha = \pm 1$ و این با $\cos \alpha = 0$ سازگار نیست.

$$\sin 2\alpha = \frac{1}{\sqrt{3}} \rightarrow 2\alpha = 2k\pi + \frac{\pi}{6} \rightarrow \alpha = k\pi + \frac{\pi}{12}$$

$$\sin 2\alpha = \sin \frac{\pi}{6} \rightarrow \alpha \in [0, \pi] \rightarrow \alpha = \frac{\pi}{12} \text{ و } \frac{5\pi}{12} \rightarrow \alpha = \frac{5\pi}{12} - \frac{\pi}{12} = \frac{\pi}{3}$$

$$\tan 2\alpha = \tan \frac{2\pi}{3} = -\tan \frac{\pi}{3} = -\sqrt{3}$$

$$\cos(\alpha + \frac{\pi}{6}) = \frac{1}{\sqrt{3}}$$

$$\sin(\frac{\pi}{6} - \alpha) \rightarrow -\sin(\alpha - \frac{\pi}{6}) = \frac{1}{\sqrt{3}}$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \rightarrow \sin^2 \alpha = \frac{1}{3} \rightarrow \sin \alpha = \pm \frac{1}{\sqrt{3}}$$

$$m(\cos \alpha - \sin \alpha) = \frac{2\sqrt{6} \times \frac{1}{\sqrt{3}}}{\sqrt{6}} = \sqrt{4} \rightarrow m = \frac{2\sqrt{6} \times \sqrt{3}}{\sqrt{2}} \rightarrow m = 6$$

$$\sin\left(m + \frac{\pi}{6}\right) \cos\left(m - \frac{\pi}{6}\right) = 1$$

$$m + \frac{\pi}{6} + \frac{\pi}{6} - m = \frac{\pi}{3} \quad \text{جمع روابطه ۹۰}$$

$$\cos\left(\frac{\pi}{6} - m\right)$$

$$\sin\left(m + \frac{\pi}{6}\right)^2 = 1 \rightarrow \begin{cases} \sin\left(m + \frac{\pi}{6}\right) = 1 \rightarrow m + \frac{\pi}{6} = 2k\pi + \frac{\pi}{6} \\ \sin\left(m + \frac{\pi}{6}\right) = -1 \rightarrow m + \frac{\pi}{6} = 2k\pi + \frac{5\pi}{6} \end{cases}$$

$$\sin \alpha = \cos \beta \quad \text{رابطه معکوس}$$

$$-m = 2k\pi + \frac{\pi}{3}$$

$$m = 2k\pi + \frac{5\pi}{3}$$

$$\frac{\pi}{3}, \frac{5\pi}{3} \rightarrow \text{مجموع جواب دارد}$$

$$\sin m + \sqrt{3} \cos m = \sqrt{2} \xrightarrow{\text{روابطه برابری}} \frac{1}{\sqrt{2}} \sin m + \frac{\sqrt{3}}{\sqrt{2}} \cos m = \frac{\sqrt{2}}{\sqrt{2}}$$

$$\sin\left(m + \frac{\pi}{6}\right) = \frac{\sqrt{2}}{2}$$

$$\begin{cases} m + \frac{\pi}{6} = 2k\pi + \frac{\pi}{6} \rightarrow m = 2k\pi \\ m + \frac{\pi}{6} = 2k\pi + \frac{5\pi}{6} \rightarrow m = 2k\pi + \frac{4\pi}{6} \end{cases}$$



$$\text{جواب ها: } -\frac{\pi}{12}, \frac{5\pi}{12}, \frac{7\pi}{12} \xrightarrow{\text{مجموع}} \frac{7\pi}{12} = \frac{9\pi}{12}$$

$$\sin m (-\cos m) = 1$$

$$\sin\left(\frac{\pi}{2} - m\right) = -\cos m$$

$$-\sin m = 1 \rightarrow \sin m = -1 \rightarrow \sin 2m = \sin -\frac{\pi}{2}$$

$$2m = 2k\pi - \frac{\pi}{2} \rightarrow m = k\pi - \frac{\pi}{4} \rightarrow k=1 \rightarrow m = \frac{11\pi}{4}$$

$$2m = 2k\pi + \frac{3\pi}{2} \rightarrow m = k\pi + \frac{3\pi}{4} \rightarrow k=0 \rightarrow m = \frac{3\pi}{4}$$

$$\frac{3\pi}{4} + \frac{11\pi}{4} = \frac{14\pi}{4} = \frac{7\pi}{2}$$

$$(1, 0)$$

$$\frac{(1 + \cos^2 \alpha)(1 + \cos^2 \beta)(1 + \cos^2 \gamma)}{(\cos^2 \alpha)(\cos^2 \beta)(\cos^2 \gamma)} = \frac{1}{\cos^2 \alpha} \rightarrow (\cos \alpha \cdot \cos \beta \cdot \cos \gamma)^2 = \frac{1}{4}$$

$$\cos \alpha \cdot \cos \beta \cdot \cos \gamma = \pm \frac{1}{2} \xrightarrow{\times \sin \alpha} \sin \alpha \cos \alpha \cdot \cos \beta \cdot \cos \gamma = \pm \frac{\sin \alpha}{2}$$

$$\sin 2\alpha = \pm \sin \alpha$$

$$\sin 2\alpha = \sin \alpha \rightarrow 2\alpha = 2k\pi + \alpha \rightarrow \alpha = 2k\pi$$

$$\sin 2\alpha = \sin -\alpha \rightarrow 2\alpha = 2k\pi - \alpha \rightarrow \alpha = \frac{2k\pi}{3}$$

$$\begin{aligned} \sin 2\alpha &= \sin \alpha \rightarrow \alpha = \frac{(2k+1)\pi}{2} \rightarrow \max = \frac{9\pi}{2} \\ \sin 2\alpha &= \sin -\alpha \rightarrow \alpha = \frac{(2k+1)\pi}{3} \rightarrow \max = \frac{13\pi}{3} \end{aligned}$$

$$\max = \frac{13\pi}{3}$$

$$\tan^2 m \tan^2 n = 1 \rightarrow \tan^2 m = \frac{1}{\tan^2 n} \rightarrow \tan^2 m = \cot^2 n$$

$$\tan^2 m = \cot^2\left(\frac{\pi}{4} - m\right) \rightarrow 2m = k\pi + \frac{\pi}{4} - m \rightarrow 3m = k\pi + \frac{\pi}{4} \rightarrow m = \frac{k\pi}{3} + \frac{\pi}{12}$$

$$k=0 \rightarrow m = \frac{\pi}{12}$$

$$k=1 \rightarrow m = \frac{5\pi}{12}$$

$$k=2 \rightarrow m = \frac{7\pi}{12}$$

$$k=3 \rightarrow m = \frac{9\pi}{12}$$

$$k=4 \rightarrow m = \frac{11\pi}{12}$$

$$k=5 \rightarrow m = \frac{13\pi}{12}$$

$$k=6 \rightarrow m = \frac{15\pi}{12}$$

$$k=7 \rightarrow m = \frac{17\pi}{12}$$

$$\frac{9\pi}{12} + \frac{11\pi}{12} + \frac{13\pi}{12} + \frac{15\pi}{12} = \frac{48\pi}{12} = 4\pi$$

در رابطه ی مورخه قرار ندهیم

[۱۲، ۲۱]

مجموع جواب ها

$$\sin\left(\frac{\pi}{4} - x\right) = -\cos x$$

①

$$4 \sin x (-\cos x) \geq 1 \rightarrow -4(\sin x \cos x) \geq 1 \rightarrow \sin 2x \leq -\frac{1}{4}$$

$$2x = 2k\pi - \frac{\pi}{4} \leq 2k\pi + \frac{\pi}{4} \rightarrow x = k\pi - \frac{\pi}{8} \leq k\pi + \frac{\pi}{8}$$

$$\begin{aligned} \xrightarrow{0 \leq x \leq 2\pi} & \quad \begin{cases} 1 \\ 2 \end{cases} k=0, 1 \rightarrow x = \frac{\pi}{8}, \frac{19\pi}{8} \\ & \quad \begin{cases} 1 \\ 2 \end{cases} k=1, 2 \rightarrow x = \frac{11\pi}{8}, \frac{25\pi}{8} \end{aligned}$$

$$S = \frac{\pi}{8} + \frac{19\pi}{8} + \frac{11\pi}{8} + \frac{25\pi}{8} = \frac{4 \cdot \pi}{1} = \boxed{4\pi}$$