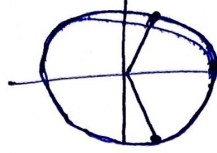


نام و نام خانوادگی ریاضیاتی پاسخنامه تشریحی تکلیف شماره ۱۷ ... کلاس ... پس از ...

$$\sec^2 x - \tan^2 x = 1 \rightarrow \sec^2 x = 1 + \tan^2 x \rightarrow \sec^2 x = \frac{1}{\cos^2 x} \rightarrow \cos^2 x = \frac{1}{\sec^2 x}$$

$$\rightarrow \cos x = \frac{1}{\sec x} \text{ و } \cos x \neq 0$$



پایاس

$$\Delta(1 - \cos^2 x) + 2(\sec^3 x - 3\cos x) = -2$$

$$\rightarrow \sec^3 x - \Delta \cos^2 x + 4\cos x + 2 = 0 \rightarrow (\cos x + 1)(\sec^2 x - 3\cos x + 2) = 0$$

$$\rightarrow \cos x = -1 \rightarrow x = 2k\pi + \pi \rightarrow \{\pi, -\pi\} \rightarrow \text{پایاس}$$

$$\sin x (2\cos^2 x + 1) = 1 \rightarrow \sin x (2(2\cos^2 x - 1) + 1) = 1$$

$$\rightarrow \sin x (4\cos^2 x - 1) = 1 \rightarrow \sin x (4 - 4\sin^2 x - 1) = 1$$

$$\rightarrow 3\sin x - 4\sin^3 x = 1 \rightarrow \sin(3x) = 1 \rightarrow 3x = 2k\pi + \frac{\pi}{2}$$

$$\rightarrow x = \frac{2k\pi}{3} + \frac{\pi}{6} \rightarrow \left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2} \right\} \rightarrow \frac{15\pi}{6} \rightarrow \text{پایاس}$$

$$\frac{1}{\sin(\frac{x}{2} + \pi)} + \frac{1}{\cos(\frac{x}{2} + \pi)} = 0 \rightarrow \frac{1}{\cos x} = \frac{1}{\sin x} \rightarrow \cos x = \sin x$$

$$\rightarrow \cos x = 0 \text{ ق ق ق}$$

$$\sin x = \frac{1}{2} \rightarrow x = 2k\pi + \frac{\pi}{6} \rightarrow x = k\pi + \frac{\pi}{12}$$

$$\rightarrow x = 2k\pi + \frac{5\pi}{6} \rightarrow x = k\pi + \frac{5\pi}{12}$$

$$\rightarrow x = \left\{ \frac{\pi}{12}, \frac{5\pi}{12} \right\} \rightarrow x = \frac{5\pi}{12} - \frac{\pi}{12} = \frac{\pi}{3}$$

$$\tan(2x) = \tan\left(\frac{2\pi}{3}\right) = -\sqrt{3}$$

$$\cos\left(x + \frac{\pi}{6}\right) = \frac{1}{\sqrt{3}} \rightarrow \cos x \cos \frac{\pi}{6} - \sin x \sin \frac{\pi}{6} = \frac{1}{\sqrt{3}} (\cos x - \sin x) = \frac{1}{\sqrt{3}}$$

$$\rightarrow \cos x - \sin x = \frac{\sqrt{3}}{3} \rightarrow \cos^2 x + \sin^2 x - 2\cos x \sin x = \frac{1}{3} \rightarrow \sin 2x = \frac{\sqrt{3}}{3}$$

$$m \times (\cos x - \sin x) - \sqrt{3} \sin 2x = \sqrt{3} \rightarrow \frac{m\sqrt{3}}{3} - \frac{\sqrt{3}}{3} = \sqrt{3} \rightarrow m = \frac{16\sqrt{3}}{3} \times \frac{3}{\sqrt{3}} = \frac{16\sqrt{3}}{3}$$

$$\sin\left(x + \frac{\pi}{4}\right) \cos\left(x - \frac{\pi}{4}\right) = \sin\left(x + \frac{\pi}{4}\right) \sin\left(x + \frac{\pi}{4}\right) = 1$$

$$\sin\left(x + \frac{\pi}{4}\right) \cos\left(\frac{\pi}{4} - x\right) = \sin\left(x + \frac{\pi}{4}\right) \sin\left(x + \frac{\pi}{4}\right) = \sin\left(x + \frac{\pi}{4}\right)^2 = 1$$

$$\rightarrow \sin\left(x + \frac{\pi}{4}\right) = \pm 1 \rightarrow x + \frac{\pi}{4} = k\pi + \frac{\pi}{4} \rightarrow x = k\pi + \frac{\pi}{4}$$

$$\text{الحل: } \left\{ \frac{\pi}{4}, \frac{5\pi}{4} \right\} \rightarrow \text{و...}$$

$$2\left(\frac{1}{4}\sin x + \frac{\sqrt{3}}{4}\cos x\right) = \sqrt{2} \rightarrow \sin\left(x + \frac{\pi}{6}\right) = \frac{\sqrt{2}}{2}$$

$$\left\{ \begin{array}{l} x + \frac{\pi}{6} = 2k\pi + \frac{\pi}{6} \rightarrow x = 2k\pi \\ x + \frac{\pi}{6} = 2k\pi + \frac{5\pi}{6} \rightarrow x = 2k\pi + \frac{2\pi}{3} \end{array} \right\} \rightarrow \left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$$

$$\frac{-\pi}{12} + \frac{5\pi}{12} + \frac{7\pi}{12} + \frac{11\pi}{12} = \frac{14\pi}{12}$$

$$4\sin x \sin\left(\frac{3\pi}{4} - x\right) = 1 \rightarrow 4\sin x \times (-\cos x) = 1 \rightarrow \sin(2x) = -\frac{1}{4}$$

$$\left\{ \begin{array}{l} 2x = 2k\pi - \frac{\pi}{6} \rightarrow x = k\pi - \frac{\pi}{12} \\ 2x = 2k\pi - \frac{5\pi}{6} \rightarrow x = k\pi - \frac{5\pi}{12} \end{array} \right\} \rightarrow \left\{ \frac{11\pi}{12}, \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{19\pi}{12} \right\}$$

$$\frac{11\pi + 5\pi + 7\pi + 19\pi}{12} = \frac{42\pi}{12} = 3\pi$$

$$(1 + \cos(\alpha))(1 + \cos(2\alpha))(1 + \cos(4\alpha)) = 4\cos^2 \alpha \times 2\cos^2(2\alpha) \times 2\cos^2(4\alpha) = 1$$

$$\rightarrow \frac{\cos \alpha \times \cos(2\alpha) \times \cos(4\alpha) \times \sin \alpha}{\sin \alpha} = \pm \frac{1}{8} \rightarrow \frac{1}{8} \sin 8\alpha = \pm \frac{1}{8} \rightarrow \sin 8\alpha = \pm 1$$

$$\rightarrow 8\alpha = k\pi + \frac{\pi}{2} \rightarrow \alpha = \frac{k\pi}{8} + \frac{\pi}{16} \rightarrow \alpha = \left\{ \frac{\pi}{16}, \frac{3\pi}{16}, \frac{5\pi}{16}, \dots, \frac{15\pi}{16} \right\}$$

الحل: $\frac{\pi}{16}$

$$\tan x \tan 3x = 1 \rightarrow \tan 3x = \cot x \rightarrow 3x = \frac{k\pi}{2} + \frac{\pi}{2}$$

$$\rightarrow x = \frac{k\pi}{6} + \frac{\pi}{6} \rightarrow \left\{ \frac{\pi}{6}, \frac{3\pi}{6}, \frac{5\pi}{6} \right\}$$

$$\rightarrow \frac{\pi + 3\pi + 5\pi}{6} = \frac{9\pi}{6} = \frac{3\pi}{2}$$