

نام و نام خانوادگی: پاشنامه تشریحی تکلیف شماره ۱۰۰ ... کلاس: دوم، از دستم
 ۴۰

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

$$\rightarrow \cos x = \pm 1 \rightarrow x \in [0, 2\pi]$$

$$\downarrow$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

پاسخ دارد.

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$$5 \sin^2 x + 4 \cos^2 x = -1 \quad \cos^2 x = \frac{1}{2} \cos x - \frac{1}{2} \cos x, \quad 5 - 5 \cos^2 x + 4 \cos^2 x - 4 \cos x + 4 = 0$$

$$5(1 - \cos^2 x) \rightarrow 1 \cos^2 x - 5 \cos^2 x - 4 \cos x + 4 = 0 \rightarrow \cos^2 x + 1$$

$$\frac{1 \cos^2 x - 5 \cos^2 x - 4 \cos x + 4}{1 \cos^2 x + 1 \cos^2 x} \quad \frac{1 \cos^2 x - 1 \cos^2 x + 4}{1 \cos^2 x - 1 \cos^2 x + 4}$$

$$-1 \cos^2 x - 4 \cos x + 4$$

$$-1 \cos^2 x - 1 \cos^2 x$$

$$\frac{4 \cos x + 4}{4 \cos x + 4}$$

✓

$$\Rightarrow (2 \cos x + 1)(1 \cos^2 x - 1 \cos^2 x + 4) = 0$$

$$\Delta = 1^2 - 4 \times 4 =$$

$$1 - 16 = -15 < 0 \quad \text{پس جواب ندارد}$$

$$\cos x = -1$$

$$\downarrow$$

$$x \in [\pi, 2\pi]$$

$$\downarrow$$

$$x = \pi, 2\pi$$

پاسخ

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

$$\rightarrow 2 \sin x - 2 \sin^3 x + \sin x = 1 \rightarrow 3 \sin x - 2 \sin^3 x + 1 = 0 \rightarrow$$

$$\frac{3 \sin x - 2 \sin^3 x + 1}{3 \sin x + 3 \sin x} \quad \frac{\sin x + 1}{3 \sin x - 2 \sin^3 x + 1}$$

$$-2 \sin^3 x - 2 \sin^3 x + 1$$

$$-2 \sin^3 x - 2 \sin^3 x$$

$$\frac{\sin x + 1}{\sin x + 1}$$

✓

$$(2 \sin x + 1)(2 \sin x - 1) = 0$$

$$\begin{cases} \sin x = -1 \rightarrow x = \frac{3\pi}{2} \\ \sin x = \frac{1}{2} \rightarrow x = \frac{\pi}{6}, \frac{5\pi}{6} \end{cases}$$

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

$$\frac{1}{\sin(\frac{\pi}{4} + 2x)} + \frac{1}{\cos(\frac{\pi}{4} + 2x)} = 0 \rightarrow \frac{1}{\cos 2x} - \frac{1}{\sin 2x} = 0 \rightarrow \cos^2 x = \sin^2 x$$

$$\rightarrow \cos^2 x = \sin^2 x \rightarrow \cos^2 x = \sin^2 x$$

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

$$\downarrow$$

پاسخ دارد

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$$\tan 2\alpha = \tan 135^\circ = -\sqrt{3}$$

$$\cos(x + \frac{\pi}{4}) = \frac{1}{\sqrt{2}} \quad \frac{1}{\sqrt{2}} \cos(x + \frac{\pi}{4}) = \frac{1 + \cos(x + \frac{\pi}{4})}{2} = \frac{1}{\sqrt{2}} \rightarrow -\sin x = \frac{1}{\sqrt{2}} - 1 \rightarrow \sin x = \frac{1}{\sqrt{2}}$$

$$m(\cos x - \sin x) = m(\sqrt{2} \sin(x - \frac{\pi}{4}))$$

$$\sqrt{2} \sin(x - \frac{\pi}{4})$$

$$m \times \sqrt{2} \cos(\frac{\pi}{4} + x) - 2\sqrt{2} \sin^2 x = \sqrt{2} \rightarrow \frac{\sqrt{2}}{2} m - \sqrt{2} = \sqrt{2}$$

$$\frac{\sqrt{2}}{2} m = 2\sqrt{2}$$

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$$\rightarrow m = \frac{2\sqrt{2}}{\frac{\sqrt{2}}{2}} = 4$$

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

$$\rightarrow x + \frac{\pi}{4} = k\pi + \frac{\pi}{4} \rightarrow x = k\pi + \frac{\pi}{4}$$

✓



در این صورت $x \in [0, 2\pi]$

$$\sin x + \sqrt{2} \cos x = \sqrt{2} \xrightarrow{\times \frac{1}{\sqrt{2}}} \frac{1}{\sqrt{2}} \sin x + \cos x = 1 \rightarrow \sin(x + \frac{\pi}{4}) = \frac{\sqrt{2}}{\sqrt{2}}$$

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

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

$$x = \frac{0\pi}{1}, \frac{2\pi}{1}, \frac{4\pi}{1}, \dots$$

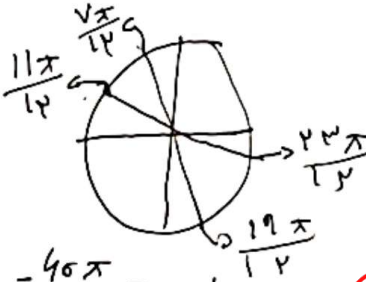
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$$\frac{\sqrt{2}\pi}{1}$$

$$f \sin x \sin(\frac{\pi}{4} - x) = 1 \rightarrow f \sin x \cos x = -1 \rightarrow f \sin 2x = -1 \rightarrow \sin 2x = -\frac{1}{f}$$

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

$$2x = 2k\pi - \frac{3\pi}{4} \rightarrow x = k\pi - \frac{3\pi}{8}$$



$$\text{مجموع جوابات} = \frac{\pi}{8} + \frac{11\pi}{8} + \frac{19\pi}{8} + \frac{27\pi}{8} = \frac{66\pi}{8} = \frac{33\pi}{4}$$

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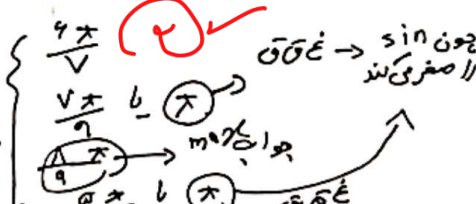
$$(1 + \cos 2\alpha)(1 + \cos 4\alpha)(1 + \cos 8\alpha) = \frac{1}{\alpha} \rightarrow \cos^2 \alpha \cos^2 2\alpha \cos^2 4\alpha = \frac{1}{8\alpha}$$

$$\rightarrow \cos \alpha \cos 2\alpha \cos 4\alpha = \pm \frac{1}{\sqrt{8\alpha}}$$

$$\rightarrow \frac{1}{\alpha} \frac{\sin 8\alpha}{\sin \alpha} = \pm \frac{1}{\alpha} \rightarrow \sin 8\alpha = \pm \sin \alpha$$

$$\sin 8\alpha = \sin \alpha \rightarrow \alpha = \frac{k\pi}{9} \text{ or } \frac{k\pi + \pi}{9}$$

$$\sin 8\alpha = -\sin \alpha \rightarrow \alpha = \frac{k\pi}{9} \text{ or } \frac{k\pi + \pi}{9}$$



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

$$2x = k\pi + \frac{\pi}{4} - x \rightarrow 3x = k\pi + \frac{\pi}{4} \rightarrow x = \frac{k\pi}{3} + \frac{\pi}{12}$$

$$k=0 \rightarrow x = \frac{\pi}{12} \quad k=1 \rightarrow x = \frac{5\pi}{12}$$

$$k=2 \rightarrow x = \frac{9\pi}{12} = \frac{3\pi}{4}$$

$$k=3 \rightarrow x = \frac{13\pi}{12}$$

✓

$$\text{مجموع جوابات} = \frac{\pi}{12} + \frac{5\pi}{12} + \frac{9\pi}{12} + \frac{13\pi}{12} = \frac{32\pi}{12} = \frac{8\pi}{3}$$