

Date:

Sub:

۲. افزین

تکلیف ۱۷

نونا امیدقانی

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

سوال ۱

$$\rightarrow \frac{1}{\cos^2 x} - 1 \cos x = \frac{1 - 1 \cos^3 x}{\cos^2 x} = 0$$

۲

$$\rightarrow 1 - 1 \cos^3 x = 0 \rightarrow \cos^3 x = \frac{1}{1} \rightarrow \cos x = \frac{1}{2} \rightarrow \begin{matrix} x = \frac{\pi}{3} \\ x = 2\pi - \frac{\pi}{3} \end{matrix}$$

۲ جواب در بازه $[0, 2\pi]$ دارد

سوال ۲

$$\omega \sin^2 x + r \cos 2x + r = \omega \sin^2 x + r (\cos 2x + 1)$$

$$= \omega \sin^2 x + r \left(\cos^2 \frac{2x}{2} \right) = \omega \sin^2 x + r \cos^2 \frac{2x}{2} = 0$$

$$\sin^2 x = 0 \rightarrow x = k\pi \rightarrow x = -\pi, 0, \pi$$

$$r \cos^2 \frac{2x}{2} = 0 \rightarrow \cos \frac{2x}{2} = 0 \rightarrow \frac{2x}{2} = k\pi + \frac{\pi}{2} \rightarrow x = \frac{2k\pi + \pi}{2} + \frac{\pi}{2}$$

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

ریشه‌های مستند $\pi, -\pi$ هستند بنابراین معادله دو جواب دارد

چون دو عبارت مستقیم چه شده‌اند و حاصل منفرجه، مگر باید منفرجه

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

$$r \sin x - r \sin^3 x + \sin x = 1$$

$$r \sin^3 x - r \sin x + 1 = 0 \quad \xrightarrow{\sin x = t}$$

$$\begin{array}{r} r t^3 - r t + 1 \\ r t^3 + r t^2 \end{array} \quad \begin{array}{r} t+1 \\ \hline r t^2 - r t + 1 \end{array}$$

$$\hline -r t^2 - r t$$

$$\hline -r t^2 - r t$$

$$\hline t+1$$

$$\hline t+1$$

$$\hline 0$$

$$r t^3 - r t + 1 = 0 \quad \text{به ازای } t = -1 \text{ صفری شود}$$

$$(t+1)^2 (r t - 1) = 0$$

$$t = -1 \quad t = \frac{1}{r}$$

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

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

$$x = 2k\pi + \frac{\omega\pi}{r}$$

$$2, \omega\pi \checkmark = \text{مجموعشان} + \frac{3\pi}{r}, \frac{\omega\pi}{r}, \frac{\pi}{r} \leftarrow [0, 2\pi]$$

سوال ۳

۲

$$\frac{1}{\sin\left(\frac{\pi}{r} + r\pi\right)} + \frac{1}{\cos\left(\frac{\pi}{r} + r\pi\right)} = \frac{1}{\cos r\pi} - \frac{1}{\sin r\pi} = 0$$

سوال ۴

۲

$$= \frac{1}{\cos r\pi} - \frac{1}{r \sin r\pi \cos r\pi} = \frac{1}{\cos r\pi} \left(1 - \frac{1}{r \sin r\pi}\right) = \frac{1}{\cos r\pi} \left(\frac{r \sin r\pi - 1}{r \sin r\pi}\right) = 0$$

$$\rightarrow r \sin r\pi - 1 = 0 \rightarrow \sin r\pi = \frac{1}{r} \quad r\pi = rK\pi + \frac{\pi}{r} \rightarrow \pi = K\pi + \frac{\pi}{rK}$$

$$r\pi = rK\pi + \frac{\omega\pi}{r} \rightarrow \pi = K\pi + \frac{\omega\pi}{rK}$$

$$\alpha = \frac{\pi}{r} = \frac{K\pi}{rK} = \text{مکمل} + \frac{\omega\pi}{rK}, \quad \frac{\pi}{rK} \in [0, \pi]$$

$$\tan \frac{r\pi}{r} = -\sqrt{r} \quad \checkmark$$

$$\cos\left(\pi + \frac{\pi}{r}\right) = \frac{1}{r\sqrt{r}} \rightarrow \cos\left(r\pi + \frac{\pi}{r}\right) = r\left(\frac{1}{r\sqrt{r}}\right)^2 - 1 = -\frac{1}{r}$$

سوال ۵

۲

$$-\sin r\pi = -\frac{1}{r} \rightarrow \sin r\pi = \frac{1}{r}$$

$$m(\cos x - \sin x) - r\sqrt{r} \times \frac{1}{r} = \sqrt{r} \rightarrow m(\cos x - \sin x) = r\sqrt{r}$$

$$\text{ممكن ان يكون } r \rightarrow m^2 \left(1 - \underbrace{\sin^2 r\pi}_{\frac{r}{r^2}}\right) = r^2 \rightarrow m^2 = r^2 \rightarrow m = \pm r, \quad m = -r \text{ غلط}$$

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

سوال ۶

۲

$$\rightarrow \cos\left(x - \frac{\pi}{r}\right) = 1 \rightarrow x - \frac{\pi}{r} = rK\pi \rightarrow x = rK\pi + \frac{\pi}{r}$$

$$\rightarrow \cos\left(x - \frac{\pi}{r}\right) = -1 \rightarrow x - \frac{\pi}{r} = rK\pi + \pi \rightarrow x = rK\pi + \frac{\pi}{r} + \pi$$

$$\text{جواب ها: بازه } [0, \pi] \leftarrow \frac{\pi}{r}, \quad \frac{4\pi}{r} \leftarrow \text{جواب}$$

$$\sin x + \sqrt{r} \cos x = \sqrt{r} \xrightarrow{\div r} \sin x \times \frac{1}{r} + \frac{\sqrt{r}}{r} \cos x = \frac{\sqrt{r}}{r}$$

سوال ۲

$$\rightarrow \sin\left(x + \frac{\pi}{r}\right) = \sin \frac{\pi}{r} \quad \textcircled{1} \rightarrow x + \frac{\pi}{r} = 2K\pi + \frac{\pi}{r}$$

$$\hookrightarrow x = 2K\pi - \frac{\pi}{r}$$

$$\textcircled{2} \rightarrow x + \frac{\pi}{r} = 2K\pi + \frac{r\pi}{r} \rightarrow x = 2K\pi + \frac{(r-1)\pi}{r}$$

۲

$$\frac{r\sqrt{r}\pi}{r} = \text{مجموعشان} \leftarrow \frac{-\pi}{r}, \frac{\pi}{r}, \frac{r\pi}{r} \leftarrow [-\pi, \pi]$$

$$r \sin x (-\cos x) = -r \sin x \cos x = -r \sin 2x = 1$$

سوال ۱

$$\sin 2x = -\frac{1}{r} \rightarrow 2x = 2K\pi + \frac{\sqrt{r}\pi}{r} \rightarrow x = K\pi + \frac{\sqrt{r}\pi}{2r}$$

$$2x = 2K\pi - \frac{\pi}{r} \rightarrow x = K\pi - \frac{\pi}{2r}$$

۲

$$\pi = \text{مجموع} \leftarrow \pi + \frac{\sqrt{r}\pi}{2r}, 2\pi - \frac{\pi}{2r}, \pi - \frac{\pi}{2r} \leftarrow [0, 2\pi]$$

$$(1 + \cos r\alpha)(1 + \cos k\alpha)(1 + \cos l\alpha) = (r\cos\alpha)(r\cos r\alpha)(r\cos k\alpha) = \frac{1}{\wedge} \quad \text{سوال 9}$$

$$\rightarrow \cos r\alpha \cos r\alpha \cos k\alpha = \frac{1}{2k} \rightarrow \cos \alpha \cos r\alpha \cos k\alpha = \pm \frac{1}{\wedge} \quad \text{2}$$

$$\begin{array}{l} \times \sin \alpha \\ \alpha \neq k\pi \end{array} \quad \underbrace{\sin \alpha \cos \alpha \cos r\alpha \cos k\alpha}_{\frac{1}{r} \sin r\alpha} \left\{ \begin{array}{l} \frac{1}{\wedge} \sin l\alpha = \frac{\sin \alpha}{\wedge} \rightarrow \sin l\alpha = \pm \sin \alpha \\ \frac{1}{k} \sin k\alpha \end{array} \right.$$

$$\textcircled{1} \sin l\alpha = \sin \alpha \rightarrow l\alpha = r k \pi + \alpha \rightarrow \alpha = \frac{r k \pi}{\wedge} \rightarrow \max = \frac{7\pi}{\wedge}$$

$$l\alpha = r k \pi + \pi - \alpha \rightarrow \alpha = \frac{r k \pi}{9} + \frac{\pi}{9} \rightarrow \max = \frac{7\pi}{9}$$

$$\textcircled{2} \sin l\alpha = \sin(\pi + \alpha) \rightarrow l\alpha = r k \pi - \alpha \rightarrow \alpha = \frac{r k \pi}{9}, \max = \frac{1\pi}{9}$$

$$\sin l\alpha = r k \pi + \pi + \alpha \rightarrow \alpha = \frac{r k \pi}{\wedge} + \frac{\pi}{\wedge} \rightarrow \max = \frac{2\pi}{\wedge}$$

$$(r)(r)(r) = \frac{1}{\wedge} \times$$

مربانیم که $\alpha = \pi$ قابل قبول نیست زیرا

بنابر این $\max$ جواب ها $\frac{1\pi}{9}$ است ✓

$$\tan \pi x = \frac{1}{\tan x} = \cot x = \tan\left(\frac{\pi}{2} - x\right)$$

سوال ۱

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

جوابها در بازه $[\pi, 2\pi]$ ← $\frac{5\pi}{4}, \frac{3\pi}{4}, \frac{11\pi}{4}, \frac{7\pi}{4}$ ← مجموعه