نام و نام خانوادگی ...طاها حق جویی...... پاسخنامه تشریحی تکلیف شماره ..۱۷.. کلاس ..دوازدهم پسر A........

۱۷

**۱**

$$1+\tan^2 x=\frac{1}{\cos^2 x}=8\cos x \to 1=8\cos^3 x \to \cos x=\frac{1}{2}=\cos\frac{\pi}{3}$$

$$\to x=2k\pi \pm \frac{\pi}{3} \to x=\frac{\pi}{3}, \frac{5\pi}{3} \to \text{۲جواب}$$

۲ ✓

**۲**

$$5(1-\cos^2 x)+2\cos 3x+2=0 \to 8\cos^3 x-5\cos^2 x-6\cos x+7=0$$

$$\xrightarrow[\text{برابر}]{\text{جمع ضرایب یکی در میان}} (\cos x+1)(8\cos^2 x-13\cos x+7)=0 \to \cos x=-1=\cos\pi$$

$$\Delta<0$$

$$\to x=2k\pi+\pi \to x=-\pi, \pi \to \text{۲جواب}$$

۲ ✓

**۳**

$$2\sin x(1-2\sin^2 x)+\sin x=1 \to \underbrace{2\sin x-4\sin^3 x+\sin x}_{3\sin x}=1=\sin 3x=\sin\frac{\pi}{2}$$

$$\to 3x=2k\pi+\frac{\pi}{2} \to x=\frac{2k\pi}{3}+\frac{\pi}{6}$$

مجموع جواب ها $=\frac{5\pi}{2}$

$$\Rightarrow x=\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$$

۱,۷۵ ✓

**۴**

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

$$\to 1=\frac{1}{2\sin 2x} \to \sin 2x=\frac{1}{2}=\sin\frac{\pi}{6} \to \begin{cases} 2x=2k\pi+\frac{\pi}{6} \to x=k\pi+\frac{\pi}{12} \\ 2x=2k\pi+\pi-\frac{\pi}{6} \to x=k\pi+\frac{\pi}{2}-\frac{\pi}{12} \end{cases}$$

$$\to \begin{cases} x_1=\frac{\pi}{12} \\ x_2=\frac{5\pi}{12} \end{cases} \to x_2-x_1=\frac{4\pi}{12}=\frac{\pi}{3} \to 2\alpha=\frac{2\pi}{3} \to \tan\frac{2\pi}{3}=-\sqrt{3}$$

۲ ✓

**۵**

$$\cos(x+\frac{\pi}{4})=\frac{1}{\sqrt{2}}(\cos x-\sin x)=\frac{1}{\sqrt{3}} \to \cos x-\sin x=\frac{\sqrt{6}}{3}$$

$$\xrightarrow[2]{\text{توان}} 1-\sin 2x=\frac{2}{3} \to \sin 2x=\frac{1}{3}$$

$$\frac{m\sqrt{6}}{3}-\frac{3\sqrt{6}}{3}=\sqrt{6} \to \frac{m}{3}-1=1 \to m=6$$

۲ ✓

۶

$\sin(x+\frac{\pi}{4})\cos(\frac{\pi}{4}-x)=\sin^2(x+\frac{\pi}{4})=1 \longrightarrow \begin{cases}\sin(x+\frac{\pi}{4})=1=\sin\frac{\pi}{2}\\ \sin(x+\frac{\pi}{4})=-1=\sin\frac{3\pi}{2}\end{cases}$

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

$\longrightarrow x+\frac{\pi}{4}=2k\pi+\frac{3\pi}{2}\longrightarrow x=\frac{5\pi}{4}$ ⟵ جواب ۲

۲ ✓

۷

$\sin x+\frac{\sin\frac{\pi}{3}}{\cos\frac{\pi}{3}}\cos x=\sqrt{2}\longrightarrow \frac{\sin x\cos\frac{\pi}{3}+\sin\frac{\pi}{3}\cos x}{\cos\frac{\pi}{3}}=\sqrt{2}$

$\sin(x+\frac{\pi}{3})=\frac{\sqrt{2}}{2}=\sin\frac{\pi}{4}\longrightarrow\begin{cases}x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4}\longrightarrow x=2k\pi-\frac{\pi}{12}\\ x+\frac{\pi}{3}=2k\pi+\pi-\frac{\pi}{4}\longrightarrow x=2k\pi-\frac{\pi}{12}\end{cases}$

$x=-\frac{\pi}{12},\ \frac{23\pi}{12}\xrightarrow{+\frac{5\pi}{12}}\frac{27\pi}{12}=\cancel{\frac{11\pi}{4}}\ \frac{9\pi}{4}$

۱,۷۵

۸

$-4\sin x\cos x=-2\sin 2x=1\longrightarrow\sin 2x=-\frac{1}{2}=\sin(-\frac{\pi}{6})$

$\begin{cases}2x=2k\pi-\frac{\pi}{6}\longrightarrow x=\cancel{\frac{11\pi}{6}}\\ 2x=2k\pi+\pi+\frac{\pi}{6}\longrightarrow x=\cancel{\frac{7\pi}{6}}\end{cases}+=3\pi$

$x=k\pi-\frac{\pi}{12}$

$\longrightarrow x=k\pi+\frac{7\pi}{12}$

$x=\frac{11\pi}{12}+\frac{19\pi}{12}+\frac{7\pi}{12}+\frac{23\pi}{12}=5\pi$ ✓

۰,۵

۹

$2\cos^2\alpha\times2\cos^2 2\alpha\times2\cos^2 4\alpha=8\frac{\sin^2\alpha}{\sin^2\alpha}\cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha$ $x=\frac{5\pi}{7}$

$=2\frac{\sin^2 2\alpha}{\sin^2\alpha}\cos^2 2\alpha\cos^2 4\alpha=\frac{1}{2}\frac{\sin^2 4\alpha}{\sin^2\alpha}\cos^2 4\alpha=\frac{1}{8}\frac{\sin^2 8\alpha}{\sin^2\alpha}=\frac{1}{8}$ $x=\frac{7\pi}{9}$

۱,۲۵

$\longrightarrow\begin{cases}\sin 8\alpha=\sin\alpha\longrightarrow\begin{cases}8\alpha=2k\pi+\alpha\longrightarrow7\alpha=2k\pi\longrightarrow\alpha=0\\ 2k\pi+\pi-\alpha\longrightarrow9\alpha=2k\pi+\pi\longrightarrow\alpha=\frac{\pi}{9}\end{cases}\\ \sin8\alpha=-\sin\alpha=\sin(-\alpha)\longrightarrow\begin{cases}8\alpha=2k\pi-\alpha\longrightarrow9\alpha=2k\pi\longrightarrow\alpha=0\\ 2k\pi+\pi+\alpha\longrightarrow7\alpha=2k\pi+\pi\longrightarrow\alpha=\frac{\pi}{7}\end{cases}\end{cases}$ ✓

$x=\frac{4\pi}{7}$

$\boxed{x=\frac{8\pi}{9}}$

۱۰

$\tan3x=\cot x=\tan(\frac{\pi}{2}-x)\longrightarrow3x=k\pi\pm(\frac{\pi}{2}-x)\longrightarrow4x=k\pi\pm\frac{\pi}{2}$

$\longrightarrow x=\frac{k\pi}{4}\pm\frac{\pi}{8}\longrightarrow x=\frac{9\pi}{8}+\frac{11\pi}{8}+\frac{13\pi}{8}+\frac{15\pi}{8}=9\pi$

۱,۷۵