نام و نام خانوادگی ......محمد کاکایی.............. پاسخنامه تشریحی تکلیف شماره .... کلاس ....۱۲۸........

۱	$8\cos x - \tan^2 x = 1 \Rightarrow 8\cos^3 - \sin^2 = \cos^2 \Rightarrow 8\cos^3 - 1 + \cos^2 = \cos^2$ $8\cos^3 - 1 = 0 \Rightarrow 8\cos^3 = 1 \Rightarrow \frac{1}{8} = \cos^3 x \Rightarrow \cos x = \frac{1}{2} \Rightarrow 2k\pi \pm \frac{\pi}{3}$ ۲ تا
۲	$5\sin^2 + 2\cos 3x = -2 \Rightarrow 5(1-\cos^2 x) + 2\cos 3x = -2 \Rightarrow 7 - 5\cos^2 x + 2\cos 3x = 0$ $7 - 5\cos^2 + 2(4\cos^3 x - 3\cos x) \Rightarrow 7 - 5\cos^2 x + 8\cos^3 x - 6\cos x = 0 \Rightarrow t = \cos$ $(t+1)(\underbrace{8t^2 - 13t + 7}_{\text{همواره مثبت}}) = 0 \Rightarrow t = -1 = \cos x \Rightarrow x = 2k\pi + \pi$ ۲ تا جواب
۳	$2\sin x\cos 2x + \sin x = 1 \Rightarrow \sin x(\underbrace{4\cos^2 - 1}_{-4\sin^2 + 3}) \Rightarrow -4\sin^3 + 3\sin = \sin 3x = 1$ ۳ جواب
۴	$\frac{1}{\sin 2x} + \frac{1}{-\sin 4x} = 0 \Rightarrow -\sin 4x + \cos 2x = 0 \Rightarrow \cos 2x = \sin 4x = \cos(\frac{\pi}{2} - 4x) \Rightarrow$ $2x = 2k\pi \pm \frac{\pi}{2} - 4x \to x = \frac{k\pi}{3} + \frac{\pi}{12}$, $\to x = k\pi + \frac{\pi}{4}$ $\Big\} \Rightarrow$ جواب‌ها $\Big\{ \pi + \frac{\pi}{4}, \frac{\pi}{4} \Big\}$ اختلاف $\Rightarrow \pi = \alpha$ $\tan 2\alpha = \tan 2\pi = 0$
۵	

① $\sin(x+\frac{\pi}{6})\cos(x-\frac{\pi}{3})=1 \Rightarrow x_1=\frac{\pi}{3}$ ② $\sin(x+\frac{\pi}{6})\cos(x-\frac{\pi}{3})=1 \Rightarrow x_2=\frac{4\pi}{3}$ $\Big\} \Rightarrow$ ۲ جواب	۶
$\sin x+\sqrt{3}\cos x=\sqrt{2} \Rightarrow \sqrt{a^2+b^2}=\sqrt{4}=2 \Rightarrow$ $2\sin(x+\alpha)$, $\tan\alpha=\sqrt{3} \Rightarrow \alpha=\frac{\pi}{3} \Rightarrow 2\sin(x+\frac{\pi}{3})=\sqrt{2} \Rightarrow$ $\sin(x+\frac{\pi}{3})=\frac{\sqrt{2}}{2} \Rightarrow x+\frac{\pi}{3}=2k\pi+\frac{\pi}{4}$, $2k\pi+\frac{3\pi}{4}$ $\Rightarrow$ ۲ جواب	۷
$-4\sin x\sin(\frac{3\pi}{2}-x)=1 \Rightarrow -4\sin\cos x=1 \Rightarrow -2\sin 2x=1 \Rightarrow \sin 2x=\frac{-1}{2} \Rightarrow$ $-\cos$ $2x=2k\pi+\frac{7\pi}{6}$, $2k\pi-\frac{\pi}{6}$ $\Big\} \Rightarrow x=k\pi+\frac{7\pi}{12}$, $k\pi-\frac{\pi}{12}$ $\Big\} \Rightarrow$ ۴ جواب	۸
$(2\cos^2 a)(2\cos^2 2a)(2\cos^2 4a) \Rightarrow \cos^2\alpha\cos^2 2\alpha\cos^2 4\alpha=\frac{1}{64} \Rightarrow \lvert\cos\alpha\cos 2\alpha\cos 4\alpha\rvert=\frac{1}{8}$ $\xrightarrow{\times\sin\alpha} \frac{1}{8}\lvert\sin 8\alpha\rvert=\frac{1}{8} \Rightarrow \lvert\sin\alpha\rvert=1 \Rightarrow 2k\pi+\frac{\pi}{2}=8\alpha$ $\Rightarrow \frac{k\pi}{4}+\frac{\pi}{16}=\alpha \Rightarrow \alpha_{max}=\frac{13\pi}{16}$	۹
$\tan(x+2x) \Rightarrow \frac{\tan x+\tan 2x}{1-\tan 2x\tan x} \Rightarrow$ نوشتن فرمول $\tan 2x$ و ساده‌سازی $\frac{3\tan x-\tan^3 x}{1-3\tan^2 x}\times\tan x=1 \Rightarrow \tan x=t$ $(3t-t^3)(t)=1-3t^2 \Rightarrow 3t^2-t^4=1-3t^2 \Rightarrow t^4-6t^2+1=0,\ t^2=z$ $z^2-6z+1 \Rightarrow z=3\pm2\sqrt{2}$ $\Delta=32,\ \frac{6\pm4\sqrt{2}}{2}$ $\sqrt{z_1}=\sqrt{3-2\sqrt{2}}=\sqrt{1-2\sqrt{2}+2}=\pm(1-\sqrt{2})$ $\sqrt{z_2}=\sqrt{3+2\sqrt{2}}=\sqrt{1+2\sqrt{2}+2}=\pm(1+\sqrt{2})$ ۴ ۴ تا جواب	۱۰