«منحنی کل سرفصل» «دوازدهم ریاضی A» تکلیف ۲۷

① $g(x)=f\big(\overset{\tan^2 x}{\overset{\uparrow}{x^2}}+\sqrt{2}-\frac{\sqrt{2}x^2}{2}\big)\to g'$

② $f(x)=\dfrac{\cancel{(2+\cos^2 x)}(4-2\cos x+\cos^2 x)}{\cancel{(2+\cos^2 x)}(2-\cos x)}$

③
$$f(x)=\begin{cases}(4x-3)\sqrt{ax} & x\geq \frac{3}{4}\\ (3-4x)\sqrt{ax} & x\leq\frac{3}{4}\end{cases}\longrightarrow f'(x)\begin{cases}4\sqrt{ax}+\dfrac{4ax-3a}{2\sqrt{ax}} & x>\frac{3}{4}\\ -4\sqrt{ax}+\dfrac{3a-4ax}{2\sqrt{ax}} & x<\frac{3}{4}\end{cases}$$

اختلاف مشتق‌های چپ و راست: $8\sqrt{ax}+\dfrac{8ax-6a}{2\sqrt{ax}}\to\dfrac{8ax+4ax-3a}{\sqrt{ax}}\to \overset{3}{12}\times\frac{3}{4}\to\dfrac{\overset{6a}{9a-3a}}{\sqrt{\frac{3a}{2}}}=\dfrac{\overset{6}{12a}}{\sqrt{3a}}=2\sqrt{6}$

$6=\sqrt{18a}\to 36=18a\to\boxed{a=2}$

④ $y=-ax+2\implies f(4)+f'(4)=-1$
$-4a+2+a=-1\longrightarrow -3a=-3\to\boxed{a=1}\implies\boxed{f'(4)=-1}$

⑤ $y=\dfrac{x+5}{7}\implies\dfrac{ax-1}{3x+1}=\dfrac{x+5}{7}\to 7ax-7=3x^2+16x+5\to 3x^2+(16-7a)x+12=0$

$\Delta=0\to 256-224a+49a^2-144=0\longrightarrow 49a^2-224a+112=0\longrightarrow(7a-28)(7a-4)$

$a=4$ یا $\boxed{a=\frac{4}{7}}\to$ ق ق در ناحیه اول

$f(x)=x^3+ax-b\to 3x^2+a\to 12+a=0\to a=-12$

$\underset{-16}{\underline{8-24}}-b=0\to\boxed{b=-16}$ $\boxed{b-a=-4}$

(۷) $\lim_{x\to 0} \frac{f(x)f'(x)}{(\underbrace{1-\cos x}_{\frac{x^2}{2}})^m} = 32\sqrt{2} \to \frac{x^{2n}\times n\times x^2\times(1-\frac{x^2}{2})}{\frac{x^{2m}}{2}} \to \frac{x^{2n+2}\times\frac{2-x^2}{\cancel{2}}\times n}{\frac{x^{2m}}{\cancel{2}}}$

$\sin^n(x^2) = x^{2n} \longrightarrow (x^{2n+2-2m})\times(2-x^2)$

$n\sin(x^2)\times\cos x = f'(x)$

(۸) $f(x)=\frac{\sqrt{x}+1}{\sqrt{x}-1}\times\frac{\sqrt{x}+1}{\sqrt{x}+1} \to f(x)=\frac{(\sqrt{x}+1)^2}{x-1} \to x=\frac{(\sqrt{y}+1)^2}{y-1}$

(۹) $\frac{y_0-y_{-1}}{1} \to \begin{cases} y_0=1 \\ y_{-1}=8(1-a)\end{cases} \Rightarrow 1-y_{-1}=-11 \to y_{-1}=\cancel{12}^{3}=\cancel{8}^{2}(1-a)$

$1-a=\frac{3}{2} \to \boxed{a=\frac{1}{2}}$

شیب آ.
لحظه‌ای
$\boxed{x=-1}$ $\longrightarrow f'(x)=3(x^2+1)^2\times \cancel{6x(ax+1)}^{6ax^2+6x}+(x^2+1)^3 a$

$\longrightarrow \cancel{(x^2+1)^2}^{4}(6ax^2+6x+ax^2+a) \to \boxed{40}$

$\frac{7}{2}x^2+6x+\frac{1}{2}$

$\frac{7}{2}+\frac{12}{2}+\frac{1}{2}=\frac{20}{2}=10$

(۱۰) $\frac{-1-0}{\frac{\pi}{4}} \to -\frac{4}{\pi}$ شیب آ. متوسط $=\frac{\Delta y}{\Delta x}$

$y=\underbrace{\sin^4 x-\cos^4 x}_{(\cancel{\sin^2+\cos^2})(\sin^2-\cos^2)}$ $\to -\cos 2x \to \frac{1-0}{\frac{\pi}{4}}=\frac{4}{\pi}$ شیب آ. متوسط

$\Rightarrow \frac{-\frac{4}{\pi}}{\frac{4}{\pi}} = -1$