$g(x)=f(\tan^2 x+\sqrt{2}\cos x) \qquad g'(\frac{\pi}{4})=\sqrt{2} \qquad f'(2)=?$ (1)

$g'(x)=2\tan(1+\tan^2)-\sqrt{2}\sin x \times f'(\tan^2 x+\sqrt{2}\cos x)$

$g'(\frac{\pi}{4})=$

$2\times f'(2)=\sqrt{2}\to f'(2)=\frac{\sqrt{2}}{2}=\frac{1}{\sqrt{2}}$

$f'(2)=\frac{\sqrt{2}}{2}=\frac{1}{\sqrt{2}}$

$f(x)=\frac{8+\cos^3 x}{4-\cos^2 x}$ و $g(x)=\frac{2}{2-\cos x} \qquad f'(\frac{7\pi}{6})-2g'(\frac{7\pi}{6})=?=-\frac{1}{2}$ (2)

$f(x)=\frac{\cos^2 x-2\cos x+4}{2-\cos x} \qquad f-2g=\frac{\cos^2 x-2\cos x}{2-\cos x}=\frac{\cos x(\cos x-2)}{2-\cos}=-\cos x$

$y=-\cos x\to y'=\sin x\to \sin\frac{7\pi}{6}=-\frac{1}{2}$

$\sin\frac{7\pi}{6}=-\frac{1}{2}$

$f(x)=|4x-3|\sqrt{ax} \qquad x=\frac{3}{4}$ (3)

$f'_-(\frac{3}{4})=\lim_{x\to\frac{3}{4}^-}\frac{f(x)-f(\frac{3}{4})}{x-\frac{3}{4}}=\frac{(3-4x)\sqrt{ax}}{x-\frac{3}{4}}=-4\sqrt{ax}_{\frac{3}{4}}=-2\sqrt{3a}$

$f'_+(\frac{3}{4})=\lim_{x\to\frac{3}{4}^+}\frac{f(x)-f(\frac{3}{4})}{x-\frac{3}{4}}=\frac{(4x-3)\sqrt{ax}}{x-\frac{3}{4}}=+4\sqrt{ax}_{\frac{3}{4}}=2\sqrt{3a}$

$4\sqrt{3a}=2\sqrt{6}\to 12a=6\to a=\frac{1}{2}$ $\qquad a=\frac{1}{2}$

$y+ax=2 \qquad f(4)+f'(4)=-1 \qquad f'(4)=?$ (4)

$-4a+2-a=-1$

$y=-xa+2$

$-5a=-3\to 5a=3\to a=\frac{3}{5}$

$y'=-a$

$f'(4)=-a=-\frac{3}{5}$

$7y-x=5 \qquad y=\frac{ax-1}{3x+1} \qquad a=? \qquad \frac{a+3}{9x^2+6x+1}$ (5)

$y=\frac{x+5}{7}=\frac{x}{7}+\frac{5}{7}\to m=\frac{1}{7}$

$\frac{1}{7}=\frac{a+3}{9x^2+6x+1}\to 7a+21=9x^2+6x+1$

$7ax-7=3x^2+16x+5\to 3x^2+(16-7a)x+12=0$

$(16-7a)^2=144\to 16-7a=\pm 12$

$\cancel{a=\frac{4}{7}}$

$a=4$ ✓

$28+21=49=(3x+1)^2\to 3x+1=7\to x=2$

$x=2$

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$x^3+ax-b=f(x)$ $\qquad b-a=?$ $\qquad -4$

$f(2)\to 8+2a-b=0$

$f'(2)=3x^2+a=12+a=0$ $\to a=-12 \to b=-16-b=0 \to b=-16$

$-16-(-12)=-4$

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$f(x)=\sin^n(x^2)$ $\quad x^{2n}$ $\qquad \lim_{x\to 0}\frac{f(x)f'(x)}{(1-\cos x)^m}=32\sqrt{2}$ $\qquad 2m+n=?$

$f'(x)=2nx^{2n-1}$

$\frac{2nx\times x^{4n-1}}{\left(\frac{x^2}{2}\right)^m}=32\sqrt{2}$ $\qquad x^{4n-2m-1}\times 2^{m+1}\times n=32\sqrt{2}=2^{\frac{11}{2}}$

$2m=4n-1\to m=2n-\frac{1}{2}$ $\qquad 2^{2n+\frac{1}{2}}\times n=2^{\frac{11}{2}}$

$\to n=2 \to m=4-\frac{1}{2}=\frac{7}{2}$ $\qquad 2m+n=7+2=9$ $\qquad 9$

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$f(x)=\frac{\sqrt{x}+1}{\sqrt{x}-1}$ $\to \sqrt{x}+1=2\sqrt{x}-2 \to \sqrt{x}=3\to x=9$

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

$\to -12$ $\qquad -12$

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$f(x)=(x^2+1)^3(ax+1)$ $\quad [-1,0]$ $\quad -11$ $\quad x=-2a$

$\frac{1-8+8a}{1}=-11\to 8a=-11+8-1=-4\to a=-\frac{1}{2}\to x=1$ $\qquad 8$

$x=1$ $\qquad 3(x^2+1)^2(2x)(ax+1)+(x^2+1)^3\times a$

$12-4=8$

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$y=\sin x\cos 2x$ $\qquad y=\sin^4 x-\cos^4 x$ $\qquad \left[\frac{\pi}{4},\frac{\pi}{2}\right]$

$\frac{f(\frac{\pi}{2})-f(\frac{\pi}{4})}{g(\frac{\pi}{2})-g(\frac{\pi}{4})}=-1$ $\qquad -1$

تکلیف ۲۳

بردیا جانفزا