محسن سلطان

(3) $f(x) = |4x-3|\sqrt{ax}$ $\quad x=\frac{3}{4}$ $\quad 2\sqrt{6}$

$\to \frac{3}{4}^{+} \to (4x-3)\sqrt{ax} \to 4\sqrt{ax} + \frac{a}{2\sqrt{ax}}\cancel{(4x-3)} = \sqrt{6}$

$\frac{3}{4}^{-} \to$ قرینه

2 $\quad \sqrt{16ax} = \sqrt{6}$

$16ax = 6 \xrightarrow{x=\frac{3}{4}} 12a = 6 \Rightarrow a = \frac{1}{2}$

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

$y = -ax + 2$ $\qquad f(4) = -4a + 2$ $\quad \xrightarrow{+} -5a + 2 = -1$

$f'(4) = -a$ $\qquad 5a = 3 \Rightarrow a = 0/6$

$y = \frac{-3}{5}x + 2$ $\quad \xrightarrow{x=4} \frac{-12}{5} + \frac{10}{5} \Rightarrow \frac{-2}{5} \Rightarrow -0/4$

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(5) $7y - x = 5$ $\qquad y = \frac{ax-1}{3x+1}$ $\qquad \frac{ax-1}{3x+1} = \frac{x+5}{7}$

$y = \frac{x+5}{7}$ $\qquad 7ax - 7 = 3x^2 + 16x + 5$ $\quad \Delta = 0$

$\to 3x^2 + (16-7a)x + 12 = 0$ $\qquad \frac{16-7a}{3} = -4$

2 $\quad x^2 + \frac{(16-7a)}{3}x + 4 = 0$ $\qquad 16 - 7a = -12$

$28 = 7a \Rightarrow a = 4$

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(6) $f(x) = x^3 + ax - b \to 3x^2 + a$ $\quad$ در نقطه‌ای به طول ۲ بر محور xها مماس است

$8 + 2a - b = 0$

$12 + a = 0 \to a = -12$ $\quad b = -16$ $\qquad b - a = -16 + 12 = -4$

هم خودش در ۲ صفره ←
هم مشتق آن

2 $\qquad -4$

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عرفان سلمانی

① $g(x)=f(\tan^2 x+\sqrt{2}\cos x)$

$g'(\frac{\pi}{4})=\sqrt{3}$

$f'(2)$

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

$\sqrt{3}=f'(2)\times 3 \Rightarrow f'(2)=\frac{\sqrt{3}}{3}$

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② $f(x)=\frac{1+\cos^3 x}{4-\cos^2 x}$ $g(x)=\frac{2}{2-\cos x}$

$\cos-2$

$2+\cos$

$2\sin\cos x$

$f'(\frac{7\pi}{6})-2g'(\frac{7\pi}{6})$

$f'(x)=\frac{3\cos^2 x-\sin(4-\cos^2 x)-(\sin 2x\times 1+\cos^3 x)}{(4-\cos^2 x)^2}$

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$g(x)'=\frac{-2\sin}{(2-\cos x)^2}\Rightarrow\frac{-2\sin x(2+\cos)^2}{(4-\cos^2 x)^2}$ (+۴)

$$\frac{(2+\cos)(\sin)(3\cos^3-6\cos^2}{(4-\cos^2 x)^2}$$

۹

کسری سلطان زاده

$f(x) = (x^2+1)^3(ax+1)$

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$\cancel{x+1 \ldots}$

$\dfrac{1+\text{۸}a-\text{۸}}{1} = -\text{۱۱}$

$\dfrac{f(0)-f(-1)}{1} \Rightarrow \dfrac{1-(-\text{۸}a+\text{۸})}{} = -\text{۱۱}$

$\text{۸}a - \text{۷} = -\text{۱۱}$

$\text{۸}a = -\text{۴}$

$a = \dfrac{-1}{\text{۲}}$

$\rightarrow -\text{۲}a = 1$

$(x^2+1)^3\left(\dfrac{-1}{\text{۲}}x+1\right)$

$\text{۳}(x^2+1)^2\left(\dfrac{-1}{\text{۲}}x+1\right) + \dfrac{-1}{\text{۲}}(x^2+1)^3 = \text{۲}$

۶ ۲ $-\text{۴}$

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۱۰ $\left[\dfrac{\pi}{\text{۴}}, \dfrac{\pi}{\text{۲}}\right]$

$y = \sin x \cos \text{۲}x$

$y = \sin^4 x - \cos^4 x$

$(\sin^2+\cos^2)$
$(\sin^2-\cos^2)$

$\dfrac{f\left(\frac{\pi}{\text{۲}}\right) - f\left(\frac{\pi}{\text{۴}}\right)}{\frac{\pi}{\text{۲}}}$

$\dfrac{\dfrac{-1-(0)}{\frac{\pi}{\text{۲}}}}{\dfrac{1-(0)}{\frac{\pi}{\text{۲}}}} = -1$

۲

۷) $f(x) = \sin^n(x^۲)$ $\quad ۲m+n=?$

$$\lim_{x\to 0} \frac{f(x)f'(x)}{(1-\cos x)^m} = ۳۲\sqrt{۲}$$

غلطه؟

$$f''(x) = n^۲-n \sin^{n-۲}(x^۲) \times ۴x^۲$$

$$f'(x) = n\sin^{n-1}(x^۲) \times ۲x$$

$$\frac{f(x)\times f''(x) + f'(x)\times f'(x)}{m(1-\cos x)^{m-1}}$$

$$m-1 = n^۲ - ۲n$$

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۸) $f(x) = \dfrac{\sqrt{x}+1}{\sqrt{x}-1} \xrightarrow{f'(9)} \dfrac{\frac{-1}{\sqrt{x}}}{(\sqrt{x}-1)^۲} \Rightarrow \dfrac{\frac{-1}{۳}}{۴} = \dfrac{-1}{۱۲}$

قرینه

-۱۲

$$\frac{\sqrt{x}+1}{\sqrt{x}-1} = ۲ \Rightarrow \sqrt{x}+1 = ۲\sqrt{x}-۲$$

$$۳ = \sqrt{x} \Rightarrow x = ۹$$

$$\frac{\sqrt{x}+1}{\sqrt{x}-1} = ۹ \Rightarrow \_\_\_\_$$

۲

۲

$$f-2g\left(\frac{7\pi}{4}\right)=\frac{(2+\cancel{\cos x})(\cos^2 x-2\cos x+4)}{(2-\cos x)(\cancel{2+\cos x})}-\frac{8}{2-\cos x}=\frac{\overset{\cos x(\cos x-2)}{\cos^2 x-\cancel{2\cos x}}}{2-\cancel{\cos x}}=-\cos x$$

$$(f-2g)'=-(\cos x)'=+\sin x\longrightarrow \sin\left(\frac{7\pi}{4}\right)=\boxed{-\frac{1}{2}}$$

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$$\lim_{x\to 0}\frac{\sin^n(x^2)\times 2x\sin^{n-1}(x^2)\times\cos x^2}{\left(2\sin^2\frac{x}{2}\right)^m}\xrightarrow{\text{هم ارزی}}\lim_{x\to 0}\frac{(x^2)^n\times n\times(x^2)^{n-1}\times 2x}{\left(2\left(\frac{x}{2}\right)^2\right)^m}=\frac{(x)^{2n+2n-2+1}\times 2n}{(x)^{2m}\times\frac{1}{2}}$$

$$=\frac{2nx^{4n-1}}{\frac{1}{2^m}\times x^{2m}}=2^{m+1}\times n\times x^{4n-2m-1}\to 4n-2m-1=0\to n=\frac{2m+1}{4}$$

$$\to 2^{m+1}\times\frac{2m+1}{4}=32\sqrt{2}\longrightarrow m=\frac{7}{2}\ ,\ n=2\to\boxed{2m+n=9}$$

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$$\frac{f(0)-f(-1)}{0-(-1)}=\frac{1-8(-a+1)}{1}=8a-7=-11\to 8a=-4\to\boxed{a=-\frac{1}{2}}$$

$$f'(x)=3(x^2+1)^2(2x)(ax+1)+a(x^2+1)^3\xrightarrow{-2a=1}f'(1)=3(2)^2(2)\left(\frac{1}{2}\right)+-\frac{1}{2}(2)^3$$

$$f'(1)=12-4=\boxed{8}$$