فرشته سلطانی مهر:

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

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

$\frac{3}{4}^{-} \rightarrow$ قرینه

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

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

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

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

$5a = 3 \Rightarrow a = 0.6$

$y = \frac{-3}{5}x + 2 \,\Big|_{x=4} \rightarrow \frac{-12}{5} + \frac{10}{5} \Rightarrow \frac{-2}{5} \Rightarrow -0.4$

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(۵) $7y - x = 5$ $\qquad y = \frac{ax-1}{3x+1}$ $\qquad \frac{ax-1}{3x+1} = \frac{x+5}{7}$

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

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

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

$28 = 7a \Rightarrow a = 4$

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

$8 + 2a - b = 0$

$12 + a = 0 \rightarrow a = -12$ $\qquad b = -16$ $\qquad b - a = -16 + 12 =$

-4

هم خودش به ازای ۲ صفره
هم مشتق آن

$\sqrt{-4}$

کرمانی سامان

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

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

$f'(2)$

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

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

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(2) $f(x) = \frac{8 + \cos^3 x}{4 - \cos^2 x}$ $\qquad g(x) = \frac{2}{2 - \cos x}$

$\cos - 2$

$2 + \cos$

$2\sin\cos x$

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

$f'(x) = \frac{3\cos^2 x - \sin(4 - \cos^2 x) - (\sin 2x \times 8 + \cos^3 x)}{(4 - \cos^2 x)^2}$

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

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

کسری سلطانه

9

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

$\cancel{x+1 = (-8a+1) \Rightarrow 8a+7 = -11}$

$\frac{1+8a-8}{1} = -11$

$\frac{f(0)-f(-1)}{1} \Rightarrow \frac{1-(-8a+8)}{1} = -11$

$8a - 7 = -11$

$8a = -4$

$a = \frac{-1}{2}$

$\rightarrow -2a = 1$

$(x^2+1)^3\left(\frac{-1}{2}x+1\right)$

$3(x^2+1)^2\left(\frac{-1}{2}x+1\right) + \frac{-1}{2}(x^2+1)^3 = 2$

$6 \quad \frac{1}{2} \quad -4$

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10 $\left[\frac{\pi}{4}, \frac{\pi}{2}\right]$ $y = \sin x \cos 2x$ $\quad y = \sin^4 x - \cos^4 x$

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

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

$\frac{f\left(\frac{\pi}{2}\right) - f\left(\frac{\pi}{4}\right)}{\frac{\pi}{2}}$

$\dfrac{\dfrac{-1-(0)}{\frac{\pi}{2}}}{\dfrac{1-(0)}{\frac{\pi}{2}}} = -1$

۷) $f(x) = \sin^n(x^2)$ $\qquad 2m + n = ?$ $\qquad$ [illegible]

$$\lim_{x \to 0} \frac{f(x)f'(x)}{(1-\cos x)^m} = 32\sqrt{2}$$

$f''(x) = n^2 - n \sin^{n-2}(x^2) \times 4x^2$

$f'(x) = n \sin^{n-1}(x^2) \times 2x$

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

$m - 1 = n^2 - 2n$

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۸) $f(x) = \dfrac{\sqrt{x}+1}{\sqrt{x}-1} \xrightarrow{f'(9)} \dfrac{\frac{-1}{\sqrt{x}}}{(\sqrt{x}-1)^2} \Rightarrow \dfrac{\frac{-1}{3}}{4} = \dfrac{-1}{12}$

[illegible]

-12

$\dfrac{\sqrt{x}+1}{\sqrt{x}-1} = 2 \Rightarrow \sqrt{x}+1 = 2\sqrt{x} - 2$

$3 = \sqrt{x} \Rightarrow x = 9$

$\dfrac{\sqrt{x}+1}{\sqrt{x}-1} = 4 \Rightarrow$ ___