Subject:
Year: Month: Day: ( ) حسین تقی پور - کلاس ۲۳ page:( )

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

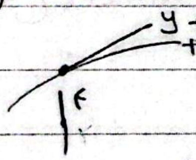
$g'(\frac{\pi}{4}) = f'(2) \times 3$ $\quad \underset{4-1}{1+1}$

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

2)

3) $x > \frac{3}{4}$ $\quad (4x-3)\sqrt{ax} \rightsquigarrow 4\sqrt{ax} + \frac{a}{2\sqrt{ax}} \times (4x-3) \longrightarrow \frac{8ax + 4ax - 3a}{}$

4)



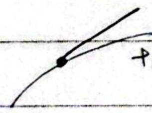
$y + ax = 2 \rightsquigarrow y = -ax + 2$ $\qquad f(4) - f'(4) = -1$

$y' = -a$ $\qquad -4a + 2 - a = -1$

$2 - 5a = -1$

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

5)



$7y - x = 5 \rightsquigarrow y = \frac{5}{7} + \frac{x}{7}$

$f = \frac{ax-1}{3x+1} \rightsquigarrow f' = \frac{a(3x+1) - 3(ax-1)}{(3x+1)^2} = \frac{1}{7} \Rightarrow \frac{\cancel{3ax} + a - \cancel{3ax} + 3}{(3x+1)^2} = \frac{1}{7}$

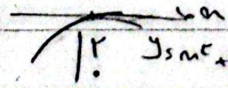
$\frac{ax-1}{3x+1} = \frac{5}{7} + \frac{x}{7} \rightsquigarrow 7ax - 7 = (5+x)(3x+1)$

$7ax - 7 = 15x + 5 + 3x^2 + x \Rightarrow 3x^2 + (16-7a)x + 12$

$\Delta = (16-7a)^2 - 4\cdot 3\cdot 12 = 0 \rightsquigarrow 16 - 7a = 12 \Rightarrow -7a = -4 \quad a = \frac{4}{7}$ ✗

$16 - 7a = -12 \Rightarrow -7a = -28 \quad a = 4$ ✓

6)



$y = x^3 + ax - b$ $\qquad y' = 3x^2 + a \underset{x=2}{\rightsquigarrow} 12 + a = 0 \quad a = -12$

$\underset{x=2}{\hookrightarrow} 8 - 24 - b = 0 \quad b = -16$ $\qquad b - a = -16 + 12 = -4$

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۷) $\lim\limits_{x\to 0} \dfrac{f(x).f'(x)}{(1-\cos x)^m} \Longrightarrow \dfrac{f'(x).f'(x)+f''(x).f(x)}{m(1-\cos x)^{m-1}} = ۳۲\sqrt{m}$

۸) $y = \dfrac{\sqrt{x}+1}{\sqrt{x}-1} \xrightarrow{f^{-1}} x\sqrt{y} - x = \sqrt{y} + 1$

$x\sqrt{y} - \sqrt{y} = x+1$

$\sqrt{y}(x-1) = x+1 \rightarrow y = \left(\dfrac{x+1}{x-1}\right)^{۲}$

$y' = ۲\left(\dfrac{x+1}{x-1}\right)\left(\dfrac{-۱-۱}{(x-1)^{۲}}\right) \Longrightarrow ۴ \times -۳ = \boxed{-۱۲}$

۹) $\dfrac{f(0)-f(-1)}{1} = -۱۱$ $\qquad ۱-(۸)(-a+۱) = ۱+۸a-۸ \rightarrow ۸a-۷ = -۱۱$

$-۸a+۸$ $\qquad ۸a = -۴ \quad a = -\dfrac{۱}{۲}$

$x=1 \quad \left(۳(x^{۲}+۱)^{۲} \times ۲x\right)\left(-\tfrac{۱}{۲}x+1\right) + \left(-\tfrac{۱}{۲}\right)(x^{۲}+1)^{۳} = \boxed{۲۰}$

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