پارسا انوری

۱- $f'(0)=0 \;/\; f''(0)=2 \;/\; f'=(3)(2)(-\sin 2x)(\cos^2 2x)+2\cos x$

$\Rightarrow f''=2a=2 \Rightarrow (a=1) \longrightarrow 0=b\cos 0 \Rightarrow b=-1$

$a+b=0$

۲- $y'=2x \;/$ بقیه: $x_1=-x_1 \;/\; 2x_1+(-2x_1)=-1 \Rightarrow x_1=\pm\frac{1}{2} \Rightarrow$

$f_{(\frac{1}{2})}=-\frac{3}{4} \;/\; f_{(-\frac{1}{2})}=-\frac{3}{4} \Rightarrow (f_{(\frac{1}{2})}+f_{(-\frac{1}{2})}=\frac{3}{2})$

۳- $m=\frac{9-(-15)}{5-(-1)}=4 \;/\; f_{(x)}=a(2x-1)^{-1} \Rightarrow f'=\frac{-2a}{(2x-1)^2}=4$ (I)

$f_{(x)}=\frac{a}{2x-1}=4x-9$ (II) (I) و (II) $\Rightarrow x=1 \Rightarrow a=-2 \Rightarrow (f_{(0)}=-\frac{1}{2})$

۴- $f'=2=\frac{(ax+1)-(ax+a^2)}{(ax+1)^2}=\frac{1-a^2}{(ax+1)^2} \xrightarrow{x=1} \frac{1-a}{a+1}=2 \Rightarrow$

$2a+2=1-a \Rightarrow (a=-\frac{1}{3})$ جایگذاری $x=1 \rightarrow (b=-1) \Rightarrow (a-b=\frac{2}{3})$

۵- $\frac{3}{2}\sin x=\frac{1}{2}+\frac{1}{2}\cos x \Rightarrow \tan x=1 \Rightarrow x=\frac{\pi}{4}$

$f'=\cos x-\frac{1}{2}\sin x=\frac{\sqrt{2}}{4} \;/\; f_{(\frac{\pi}{4})}=\frac{3\sqrt{2}}{8} \;/\; y=\frac{\sqrt{2}}{4}x+\frac{3\sqrt{2}}{8}-\frac{\sqrt{2}\pi}{16}$

$\frac{\sqrt{2}}{4}x+\frac{3\sqrt{2}}{8}-\frac{\sqrt{2}\pi}{16}=0 \Rightarrow (\frac{x}{\frac{\pi}{4}}=\frac{\pi}{4}-3)$

پارسا انوری

۶- $f' = 6x^2 - 6x - 12 = 0 = x^2 - x - 2 \Rightarrow x < \begin{matrix} 2 \\ -1 \end{matrix}$

$f_{(-1)} = 8 \ / \ f_{(2)} = -19 \ / \ m_{AB} = \frac{-27}{3} = -9 = f'$

$6x^2 - 6x - 12 = -9 \Rightarrow 2x^2 - 2x - 1 = 0 \quad \Delta > 0 \Rightarrow$

۲ نقطه روی منحنی وجود دارد

۷- $f' = 3kx^2 + 2(k+1)x \rightarrow f'' = 6kx + 2k + 2 = 0 \Rightarrow$

$\frac{-(2k+2)}{6k} < 0$ $\quad \begin{matrix} & -1 & & 0 & \\ - & | & + & | & - \end{matrix}$ $/ \ k < 0 \Rightarrow k < -1 \ \text{(I)} \ / \ x = \frac{-(k+1)}{3k}$

$f_{(x)} = k \times \left(\frac{-(k+1)}{3k}\right)^3 + \frac{(k+1)^3}{9k^2} = \frac{2(k+1)^3}{27k^2} > 0 \Rightarrow k > -1 \ \text{(II)}$

$\text{I} \cap \text{II} \rightarrow \emptyset$ هیچ مقدار k نیست

۸- نقطه عطف: $f'' = 6x + 2a = 0 \Rightarrow a = 3 \ / \ f_{(1)} = a - b - 2 = -4 \Rightarrow$

$\Rightarrow b = 5 \Rightarrow \frac{a}{b} = \frac{3}{5}$

۹- $f_{(0)} = 4 \Rightarrow c = 4 \quad f'_{(0)} = 0 \Rightarrow b = 0 \quad f'_{(x)} = 3x^2 + 2ax = 0 \Rightarrow$

$x(3x + 2a) = 0 \Rightarrow x = -\frac{2}{3}a \ / \ f_x = 0 \Rightarrow (-\frac{2}{3}a)^3 + a(-\frac{2}{3}a)^2 + 4 =$

$-\frac{8}{27}a^3 + \frac{4}{9}a^3 + 4 = \frac{4}{27}a^3 + 4 = 0 \Rightarrow a = -3 \ / \ x_{min} = \frac{-2a}{3} = 2$

پاسخ تمرین

۱۰- $f' = 4x^3 - 12x$ | $f'' = 12x^2 - 12$

$f'' = 0 \Rightarrow C\left|_{0}^{1}\right.$ $D\left|_{0}^{-1}\right.$ | $f' = 4x(x+\sqrt{3})(x-\sqrt{3})$

$A\left|_{-4}^{\sqrt{3}}\right.$ $B\left|_{-4}^{-\sqrt{3}}\right.$ | $m_{AB} = 0$ $m_{CD} = 0 \Rightarrow$ زاویه بین آن‌ها ۰ است / موازی‌اند