کلاس ششم ...
بسم الله الرحمن الرحیم
نیلوفر حیدری

سوال ۱

$1-\frac{a}{x} \longrightarrow \frac{f(3)-f(1)}{3-1} \longrightarrow \frac{1-\frac{a}{3}-1+a}{2} \longrightarrow +\frac{2a}{3\times 2} \longrightarrow +\frac{a}{3}$

$1-ax^{-1} \longrightarrow f'(x) = ax^{-2} \longrightarrow \frac{a}{x^2}$

$\frac{a}{3}=\frac{a}{x^2} \longrightarrow \boxed{x=\pm\sqrt{3}}$

سوال ۲

$2ax^2-5x+18a=x \longrightarrow 2ax^2-6x+18a=0$

$36-4(2a)(18a) \longrightarrow 36-144a^2=0 \longrightarrow 36=144a^2 \longrightarrow a=\pm\frac{1}{2}$

$4ax-5=1 \longrightarrow ax=\frac{3}{2} \longrightarrow \text{if } a=+\frac{1}{2} \longrightarrow x=3$

$\begin{vmatrix}3\\3\end{vmatrix} \longrightarrow 2(\frac{1}{2})9-15+6 \longrightarrow 18-15=3 \longrightarrow \boxed{a=\frac{1}{2}}$

$a=-\frac{1}{2}$ غ ق ق

سوال ۳

$y=x^3-12x+2 \longrightarrow y'=3x^2-12=0 \longrightarrow x^2-4=0$

x		-2		2	
y'	$+$		$-$		$+$
y	↗	$+18$	↘	-14	↗

min نسبی $\longrightarrow \begin{vmatrix}2\\-14\end{vmatrix}$

سوال ۴

$y' \longrightarrow 3x^2+2ax-2b$

$\xrightarrow{(0,2)} 2b=0 \longrightarrow \boxed{b=0}$

$\xrightarrow{(-2)} 12-4a \longrightarrow \boxed{a=3}$

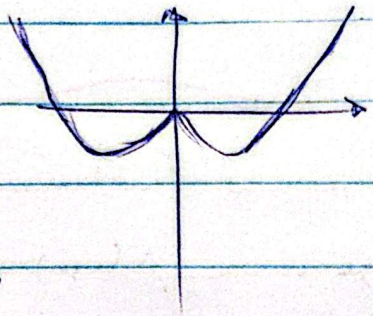
$f=x^3+3x^2-4$

$f\begin{vmatrix}0\\-4\end{vmatrix} \qquad f\begin{vmatrix}-2\\0\end{vmatrix} \longrightarrow \sqrt{(0-(-4))^2+(-2-0)^2}$

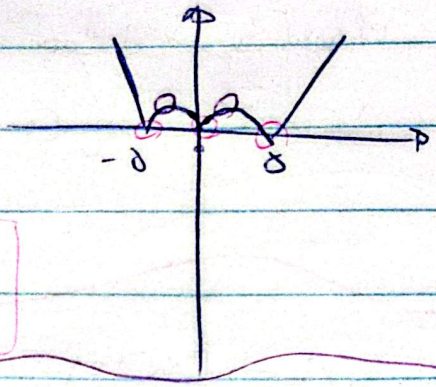
$\sqrt{16+4} \quad \boxed{\sqrt{20}}$

مثال ④

$$f(x)=\begin{cases} x^2-4x & x\geq 0 \\ x^2+4x & x<0 \end{cases}$$



$|f(x)|$



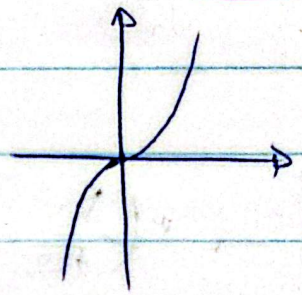
$\frac{x}{m} \to \frac{2}{2}$

$2 \leftarrow \max \leftarrow x$

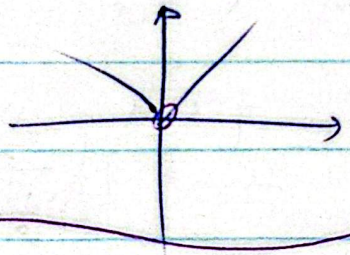
$-4 \leftarrow \min \leftarrow x$

مثال ⑤

$$f(x)=\begin{cases} x^2+2x & x\geq 0 \\ 1 & \\ -x^2+2x & x<0 \end{cases}$$



$|f(x)| \to$



$\longrightarrow$ نقطه تیز

مثال ⑥

$$y=\sqrt[3]{x^2}\,|x-a| \xrightarrow{x<a} \sqrt[3]{x^2}(a-x)$$

$$y'(x)=\frac{2(a-x)}{3\sqrt[3]{x}}+(-1)\sqrt[3]{x^2} \to \frac{2a-2x-3x}{3\sqrt[3]{x^4}} \neq 0$$

$$2a-5x=0 \to 2a=5x \to x=\frac{2a}{5}$$

$$\sqrt[3]{\left(\frac{2a}{5}\right)^2}\left(\frac{2a}{5}\right)=\frac{8}{27} \to \sqrt[3]{\left(\frac{2a}{5}\right)^2 a}=\frac{2}{3} \to \frac{4a^2}{25}\times a^2=\frac{125}{64}$$

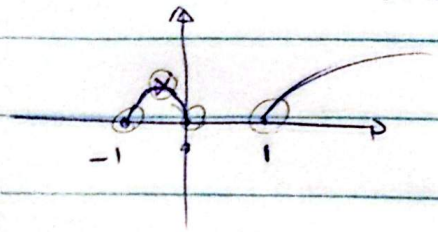
$$a^4=\left(\frac{5}{2}\right)^4 \to a=\frac{5}{2}=2{,}5$$

سوال ۱

$$f(x)=\begin{cases}\sqrt{x^2-x} & x\geq 0\\ \sqrt{-x^2-x} & x<0\end{cases}$$

$x(x-1)$: $+$ | $-$ | $+$ at 0, 1

$-x(x+1)$: $-$ | $+$ | $-$ at -1, 0



$x \to \max$ نسبی $\to$ 1

$x \to \min$ نسبی $\to$ نداریم

$K \to$ نقاط بحرانی $\to$ $-\frac{1}{2}$ و ۰

$$\frac{km+n}{k-n} \to \frac{f(1)+0}{f-0} = 1$$

سوال ۲

$$y=\frac{mx+2}{x+m-1} \longrightarrow \frac{(m(m-1)-2)}{(x+m-1)^2} \geq 0$$

$m^2-m-2 \leq 0 \to (m+1)(m-2) \leq 0$: -1 | $-$ | 2

if $y=-1 \to y=\frac{-x+2}{x-2} \Rightarrow y=-1 \to$ تابع ثابت

$\to \{-1, 0, 1\}$ ← تعداد

سه مقدار

سوال ۳

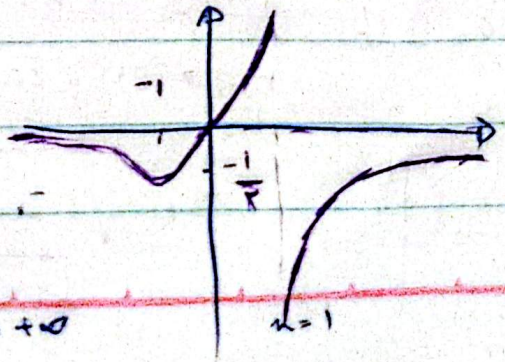
$$f(x)=\begin{cases}\frac{x}{1-x^2} & x\geq 0\\ \frac{x}{1+x^2} & x<0\end{cases} \qquad f'(x)=\begin{cases}\frac{1(1-x^2)-(2x)(x)}{(1-x^2)^2}=\frac{1+x^2}{(1-x^2)^2} & x>0\\ \frac{1(1+x^2)-(2x)x}{(1+x^2)^2}=\frac{1-x^2}{(1+x^2)^2} & x<0\end{cases}$$

$y=\frac{x}{1-x^2} \to y=0$ مجانب افقی

$f(x) \to$ مجانب ندارد

$\frac{x}{1-x^2} \to \frac{x}{-x^2} \to -\infty$

$x \to 1^+ \to -\infty$ ، $x \to 1^- \to +\infty$



$\frac{x}{1+x^2} - 0 = \frac{x}{1+x^2} \longrightarrow x \to -\infty \to y \to -\infty$

$\frac{1-x^2}{(1+x^2)^2} = 0 \longrightarrow 1-x^2 = 0 \longrightarrow x = 1$ [illegible]

$x = -1 \to y = -\frac{1}{2}$

$\left|-\frac{1}{4}\right|$ است یه نقطه بحرانی | [illegible]

یه نقطه بحرانی نیست ندارد خصوصاً منحنی اصلاً تابع نیست.

خسته نباشین، تا دیدار بعد مراقب خودتون باشین ♥