نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۵ ... کلاس .....

۱

$f(a)=1-\frac{a}{x} \Rightarrow [1,3] \rightsquigarrow \frac{1-\frac{a}{3}-1+a}{2}=\frac{a}{3}$

$f'(x)=\frac{a}{x^2} \rightarrow x=\pm\sqrt{3}$

۲

$y=3ax^2-5x+11a$

$\hookrightarrow 3ax^2-5x+11a=x \rightsquigarrow 3ax^2-6x+11a=0 \rightsquigarrow \Delta=0 \Rightarrow 36-132a^2=0$

$\hookrightarrow 36=132a^2 \rightarrow a^2=\frac{1}{4} \rightarrow a=\pm\frac{1}{2}$

$y'=3ax-5=1$

$\hookrightarrow 3ax=6 \Rightarrow \begin{cases} 2x=6 \Rightarrow x=3 \rightarrow \text{(1) عبور} \times \\ -2x=6 \rightarrow x=-3 \rightarrow \text{(3) عبور} \Rightarrow a=-\frac{1}{2} \end{cases}$

۳

$y=x^3-12x+2 \rightarrow \begin{cases} x=2 \Rightarrow 8-24+2 \rightarrow -14 \rightarrow \text{می‌نیمم} \\ x=-2 \Rightarrow -8+24+2 \rightarrow +18 \rightarrow \text{ماکزیمم} \end{cases}$

$\hookrightarrow y'=3x^2-12$

$3x^2-12=0 \rightarrow x^2=4$

$\Rightarrow x=\pm 2$

۴

$y=x^3+ax^2-2bx-2 \Rightarrow x^3+3x^2-2$

$y'=3x^2+2ax-2b \rightarrow b=0, a=3$

$\hookrightarrow 3x(x+2) \Rightarrow 3x^2+6x$

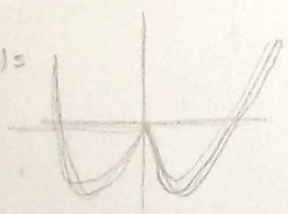
$\hookrightarrow A\left|\begin{matrix}0\\-2\end{matrix}\right. \quad B\left|\begin{matrix}-2\\0\end{matrix}\right.$

$\Rightarrow AB=\sqrt{4+4}=2\sqrt{2}$

۵

$f(x)=x^2-2|x|$

$f(x)=$



$y=|f(x)|$

$\min$ نسبی $=-3 \Rightarrow n=3$

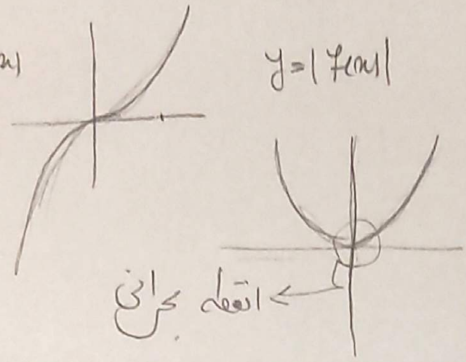
$\max$ نسبی $=2 \rightarrow m=2$

$\frac{3}{2}$

۶

$f(x)=x(|x|+4)$

$\begin{cases} x^2+4x \\ -x^2+4x \end{cases} \Rightarrow y=|f(x)| \to$



۷

$f(x)=x^{\frac{2}{3}}|x-a| \Rightarrow (a-x)\sqrt[3]{x^2} \Rightarrow ax^{\frac{2}{3}}-x^{\frac{5}{3}} \to f'(x)\ \frac{2}{3}ax^{-\frac{1}{3}}-\frac{5}{3}x^{\frac{2}{3}}$

$\frac{x^{-\frac{1}{3}}}{3}(2a-5x)=0 \begin{cases} x=0 \ ✗ \\ \frac{5}{2}x=a \ ✓ \end{cases} \Rightarrow \left(\frac{5}{2}x-x\right)x^{\frac{2}{3}}=1.5 \Rightarrow \frac{3}{2}x^{\frac{5}{3}}=1.5$

$\Rightarrow x=1 \to a=2.5$

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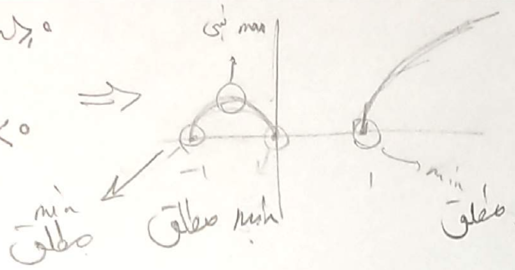
$f(x)=\sqrt{x|x|-x} \quad \begin{cases} \sqrt{x^2-x} & ; x\geq 0 \\ \sqrt{-x^2-x} & ; x<0 \end{cases} \Rightarrow$



$\Rightarrow m=1,\ n=0,\ k=4 \to \frac{4+0}{4-0}=\frac{4}{4}=1$

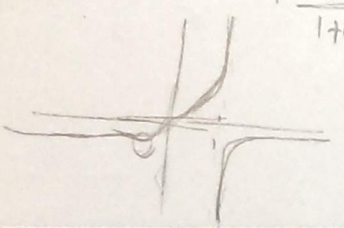
۹

$y=\frac{mx+2}{x-1+m} \Rightarrow y'=\frac{m(x-1+m)-(mx+2)}{m^2}=\frac{m^2-m-2}{m^2}>0$

$\frac{(m-2)(m+1)}{m^2}>0 \Rightarrow$ (جدول علامت: -1، 0^*، 2 : $+\ -\ -\ +$) $\Rightarrow m\in[-1,2) \to \{-1,0,1\}$

۱۰

$f(x)=\frac{x}{1-x|x|} \begin{cases} \frac{x}{1-x^2} \Rightarrow \frac{1-x^2+2x\cdot x}{(1-x^2)^2} \Rightarrow \frac{x^2+1}{(1-x^2)^2}=0 \to x^2+1=0 \to \text{ریشه ندارد} \\ \frac{x}{1+x^2} \Rightarrow \frac{1+x^2-2x\cdot x}{(1+x^2)^2} \Rightarrow \frac{-x^2+1}{(1+x^2)^2}=0 \to 1-x^2=0 \to x=\pm 1 \to x=-1 \end{cases}$



۱ نقطه‌ی بحرانی