به نام خدا

لوبیامافلیان

DATE / / SUBJECT:

(1) $f(1)=1-a,\ f(3)=1-\frac{a}{3},\ f'(x)=ax^{-2} \to \frac{\frac{2}{3}a}{2}=\frac{a}{3}=ax^{-2}\to \frac{1}{x^2}=\frac{1}{3}\xrightarrow{x\in[1,3]}$

$\boxed{x=\sqrt{3}}$

(2) $2ax^2-5x+18a=x\to 2ax^2-6x+18a=0\to ax^2-3x+9a=0\to \Delta=0\to$

$\to 9-36a^2=0\to a^2=\frac{1}{4}\to a=\pm\frac{1}{2}$ $4ax-5=1\to x=\frac{6}{4a}<0\to a<0\to$

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

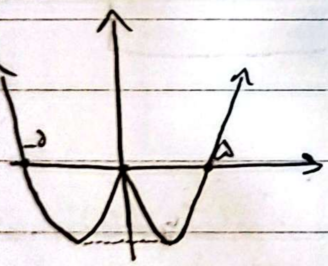
(3) $y'=3x^2-12=0\to x=\pm 2\to$ $-\infty\ \ -2\ \ 2\ \ +\infty$; $+\ \ -\ \ +$ $\to x=2\to y=8-24+2=\boxed{-14}$

(4) $y'=3x^2+2ax-2b \to x=0\to y'=0\to b=0$

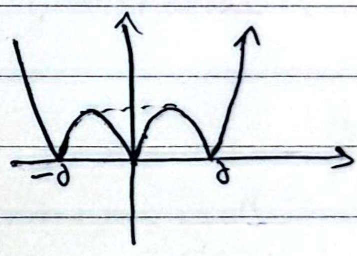
$\to x=-2\to y'=0\Rightarrow 12-4a=0\to a=3$ $\Big\}\Rightarrow y=x^3+3x^2-4$

$\to A\begin{vmatrix}0\\-4\end{vmatrix},\ B\begin{vmatrix}-2\\0\end{vmatrix}\to d_{AB}=\sqrt{2^2+4^2}=\boxed{2\sqrt{5}}$

(5) $y=x^2-5|x|$



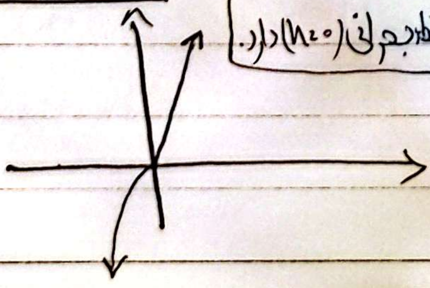
$\to$ $y=|f(x)|$



$\to$

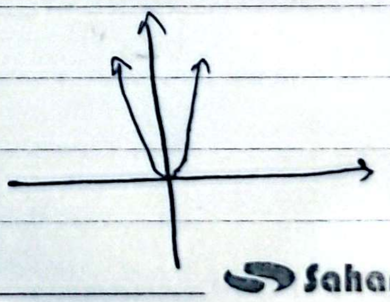
$m=2,\ n=3\to \boxed{\frac{n}{m}=\frac{3}{2}}$

(6) $f(x)=x(|x|+2)$



یک نقطه بحرانی $(x=0)$ دارد.

$y=|f(x)|$



الویا لطفیان

DATE / / SUBJECT:

$\frac{2}{3}x^{-\frac{1}{3}}(x-a)+(1)(x^{\frac{2}{3}})=0 \to \frac{2}{3}(x-a)+x=0 \to \frac{5}{3}x=\frac{2}{3}a \to x=\frac{2}{5}a$ ۷

$x^{\frac{2}{3}}(\frac{2}{3}x-\frac{2}{3}a+x)=0 \to \dots$

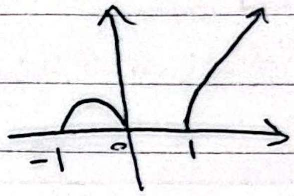
$0\le x\le a \to f(x)=\sqrt[3]{x^2}(-x+a) \to f'(x)=\frac{2}{3}x^{-\frac{1}{3}}(-x+a)+(-1)(x^{\frac{2}{3}})=x^{-\frac{1}{3}}(-\frac{2}{3}x+\frac{2}{3}a-x)$

$=x^{-\frac{1}{3}}(-\frac{5}{3}x+\frac{2}{3}a) \to$ $\begin{array}{c|c|c} & 0 & \frac{2}{5}a \\ - & + & - \end{array}$ $\to f(\frac{2}{5}a)=1.5 \to (\frac{2}{5}a)^{\frac{2}{3}}\times(\frac{3}{5}a)=\frac{3}{2} \to$

$a\times(\frac{2}{5}a)^{\frac{2}{3}}=\frac{5}{2} \to a^{\frac{5}{3}}\times(\frac{4}{25})^{\frac{1}{3}}=\frac{5}{2} \to a^{\frac{5}{3}}=(\frac{5}{2})^{\frac{5}{3}} \to \boxed{a=2.5}$

$0\le x$ $f(x)=\sqrt{x^2-x}$

$0>x$ $f(x)=\sqrt{-x^2-x}$ ۸



$m=1, n=0, k=3 \to \frac{km+n}{k-n}=\frac{3}{3}=\boxed{1}$

$y=\frac{mx+2}{x+m-1} \to y'=\frac{m(m-1)-2}{(x+m-1)^2}=\frac{(m-2)(m+1)}{(x+m-1)^2} \to$ $\begin{array}{ccc} & -1 & 2 \\ + & - & + \end{array}$ ۹

$m\in[-1,2) \to 1-m\le 1 \to 0\le m \to \boxed{m\in[0,2)} \to m=0,1 \to$

به ازای دو مقدار صحیح

$0\le x$ $\frac{x}{1-x^2} \to 1-x^2=0 \to \boxed{x=1}$ بحرانی , $\frac{1-x^2-(-2x)(x)}{(1-x^2)^2}=\frac{x^2+1}{(1-x^2)^2}\neq 0$ ۱۰

$0>x$ $\frac{x}{1+x^2} \to 1+x^2\neq 0 \to \frac{1+x^2-(2x^2)}{(1+x^2)^2}=\frac{1-x^2}{(1+x^2)^2} \to \boxed{x=-1}$ بحرانی

دو نقطه بحرانی دارد $(x=\pm 1)$