شماره تکلیف : ۲۶

محمدیار رسا آخوندی

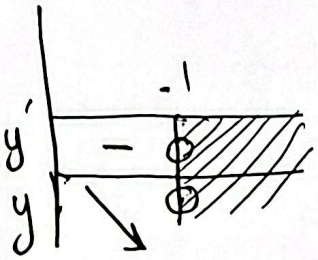
۱.

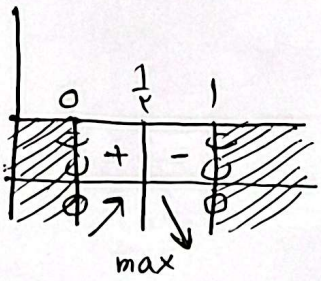
$x \geq 0 \rightarrow \sqrt{x-x^2} \xrightarrow{\text{مشتق}} \frac{1-2x}{2\sqrt{x-x^2}} \rightarrow x=\frac{1}{2}$, $x=0,1$

$D=[0,1]$

$x<0 \rightarrow \sqrt{x+x^2} \xrightarrow{\text{مشتق}} \frac{1+2x}{2\sqrt{x+x^2}} \rightarrow x=-\frac{1}{2}$ (در دامنه نیست), $x=-1$

$D=(-\infty,-1] \cup [0,+\infty)$





$\left.\begin{matrix} m=1 \\ n=0 \\ k=4 \end{matrix}\right\} m+n+k=5$

۳.

$-2 \leq x \leq 2 \rightarrow \frac{4x^2-x^4}{x^2-1} \xrightarrow{\text{مشتق}} \frac{-2x(x^4-2x^2+4)}{(x^2-1)^2}=0 \rightarrow \boxed{x=0}$

$x>2, x<-2 \rightarrow \frac{x^4-4x^2}{x^2-1} \xrightarrow{\text{مشتق}} \frac{2x(x^4-2x^2+4)}{(x^2-1)^2}=0 \rightarrow x=0$ (در دامنه نیست)

$\boxed{x=2,\ x=-2}$ ← ریشه قدرمطلق

۳ نقطه اکسترمم نسبی

۲.

$D=\left[0,\frac{a}{2}\right]$ $\begin{matrix} x=0 \rightarrow \sqrt{a} \\ x=a \rightarrow \sqrt{\frac{a}{2}} \end{matrix}$ $\left.\begin{matrix} \end{matrix}\right\} \sqrt{a} \times \sqrt{\frac{a}{2}} = \sqrt{12}$

$\frac{a^2}{2}=12 \rightarrow a=2\sqrt{6}$

$\boxed{[a]=4}$

۴. $3ax^2+2bx+c \xrightarrow{\text{مشتق}} 3a+2b+c=0 \xrightarrow{x=1} 3a+2b=0$, $x=0 \to c=0$

$ax^3+bx^2+cx+d \xrightarrow{x=1} a+b+c+d=1 \to a+b=1$, $d=0$

$a=-3$, $b=3$, $ab=-9$

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۵. $-\sqrt{3} \le x \le \sqrt{3} \to 3x-x^3 \xrightarrow{\text{مشتق}} 3-3x^2=0 \to 3(1-x^2)=0$

$x=-1,1$

	-1.5	-1	1	$\sqrt{3}$
y	$-\frac{9}{8}$	-2	2	0

min مطلق

$(-1,-2)$

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۶. $x=-1 \to 1+2a+b=1 \to 2a+b=0$

$b=\frac{3}{2}$

$-x^3+2ax^2+b \xrightarrow{\text{مشتق}} -3x^2+4ax \xrightarrow{x=-1} -3-4a=0 \to -4a=3$

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

$-2=\frac{\frac{3}{2}}{-\frac{1}{2}}=\frac{b}{a}$

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۷. $\min=\frac{-b}{2a} \to \frac{-1}{3} \xrightarrow{x=-\frac{1}{3}} \frac{1}{9}-\frac{1}{3}+\frac{5}{9}=\frac{2}{3}$

$\min=(-\frac{1}{3},\frac{2}{3})$

مجانب قائم $\Longrightarrow (a+1)x+(a-1)=0 \to x=\frac{1-a}{a+1}=-\frac{1}{2} \to a=2$

$\frac{2x+3}{3x+1}=0 \to 2x+3=0 \to x=-\frac{3}{2}$

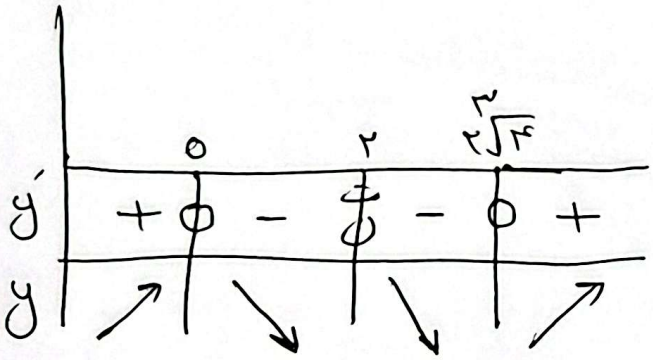
۸- $4x^2+ax+1=0 \xrightarrow{x=-\frac{1}{2}} 1-\frac{a}{2}+1=0 \rightarrow a=4$

$\lim_{x\to+\infty}\frac{bx^2}{4x^2}=2 \rightarrow \frac{b}{4}=2 \rightarrow b=12 \rightarrow \frac{b}{a}=3$

۹- مشتق $\rightarrow \frac{x^3(x^3-32)}{(x^3-1)^2}$

$\rightarrow x=0, 2\sqrt[3]{4}$ → مشتق صفره

$\rightarrow x=2$ ← مشتق وجود نداره



$\rightarrow [0,2)\cup(2,2\sqrt[3]{4}]$

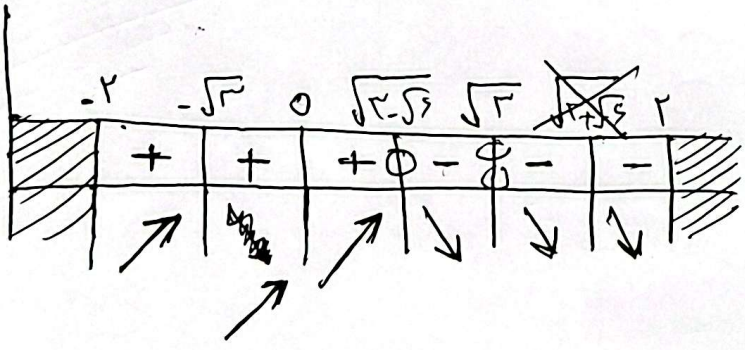
تابع نزولی است

جواب : $[2,2\sqrt[3]{4}]$

۱۰- مشتق $\rightarrow \frac{2x(x^4-6x^2+2)}{(x^2-2)^2}$

$\rightarrow x=0, \cancel{\sqrt{3+\sqrt{6}}}, \sqrt{2-\sqrt{6}}$

$\rightarrow x=\sqrt{2}, -\sqrt{2}$



$\rightarrow$ ~~[redacted]~~ $\left[\sqrt{2-\sqrt{6}}, \sqrt{2}\right)\cup(\sqrt{2},2)$