درنیا حسینی — تکلیف ریاضی — گروه دوازدهم دفتر A — تکلیف شماره ۲۶

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$f(x)=\sqrt{x}+\sqrt{a-2x} \rightarrow f'(x)=\frac{1}{2\sqrt{x}}-\frac{2}{2\sqrt{a-2x}}=\frac{\sqrt{a-2x}-2\sqrt{x}}{2\sqrt{x}\times\sqrt{a-2x}} \rightarrow \sqrt{a-2x}=\sqrt{4x} \rightarrow a-2x=4x \rightarrow a=6x$

$f'(x)=0 \rightarrow \sqrt{a-2x}=2\sqrt{x}$

$\rightarrow a=6x=6\sqrt{3}-6\sqrt{2}=[10.2-8.4]=[1.8]=①$

$f(x)=\sqrt{6x}+\sqrt{4x} \rightarrow f(6x)=\sqrt{6x}+\sqrt{4x} \rightarrow max$

$D_x=[0,\frac{a}{2}] \rightarrow f(0)=0+\sqrt{6x} \rightarrow min$

$x=\frac{a}{2} \rightarrow x=\frac{6x}{2}=3x \rightarrow \sqrt{3x}+\sqrt{4x}$

$\rightarrow max \times min=(\sqrt{6x}+\sqrt{4x})\sqrt{6x}=6x+\sqrt{24x^2}=$

$\rightarrow 6x+x\sqrt{24} \rightarrow 6x+2x\sqrt{6}=\sqrt{12} \rightarrow 2x(3+\sqrt{6})=\sqrt{12}$

$\rightarrow 2x=\frac{\sqrt{12}}{2(3+\sqrt{6})}=\frac{\sqrt{3}}{3+\sqrt{6}}\times\frac{3-\sqrt{6}}{3-\sqrt{6}}=\frac{3\sqrt{3}-3\sqrt{2}}{3}=\sqrt{3}-\sqrt{2}$ (4×6)

۴

$y=ax^3+bx^2+cx+d$

$\rightarrow y'=3ax^2+2bx+c$ { $x=1 \rightarrow y'=0 \rightarrow 3a+2b+c=0 \rightarrow 3a+2b=0$; $x=0 \rightarrow y'=0 \rightarrow c=0$ }

$\rightarrow a+b=1 \rightarrow 2a+2b=2 \rightarrow a=2,\ b=-1$

$(0,0) \rightarrow x=0 \rightarrow d=0$

$a\times b=(-2)$

$(1,1) \rightarrow a+b=1$

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$f(x)=x|3-x^2|$ { $3<x^2 \rightarrow x^3-3x \rightarrow f'(x)=3x^2-3 \rightarrow x=\pm1$; $3>x^2 \rightarrow -x^3+3x \rightarrow f'(x)=-3x^2+3 \rightarrow x=\pm1$ }

$3-x^2<0 \rightarrow 3<x^2$

$\rightarrow x=1 \rightarrow 1|3-1|=2 \rightarrow max$ ✗

$\rightarrow x=-1 \rightarrow 1|3-1|=2$

$\rightarrow x=-\frac{3}{2} \rightarrow -\frac{3}{2}|\frac{3}{2}|=\boxed{-\frac{9}{4} \rightarrow min} \rightarrow$ مطلق مشتق

$\rightarrow x=\sqrt{3} \rightarrow \sqrt{3}|3-0|=0$

۶

$y=x^2|x|+3ax^2+b \rightarrow x=-1, y=1 \rightarrow 1+3a+b=1 \rightarrow 3a+b=0 \rightarrow (b=-6)$

$\rightarrow y'=3x^2+6ax \rightarrow x=-1, y'=0 \rightarrow 3-6a=0 \rightarrow (a=2)$

$\frac{b}{a}=\frac{-6}{2}=(-3)$

۹

$f(x)=\frac{x^4}{x^3-8} \rightarrow f'(x)=\frac{4x^3(x^3-8)-x^4(3x^2)}{(x^3-8)^2}=\frac{4x^6-32x^3-12x^6}{(x^3-8)^2}=\frac{-8x^3(x^3+4)}{(x^3-8)^2}$

($-8x^6$; $x^3 \rightarrow 0$; $x^3+4 \rightarrow -\sqrt[3]{4}$; $x=2$)

		$-\sqrt[3]{4}$		0		2	
y'	+		−		+		−
y	↗		↘	min	↗		↘

$\rightarrow \boxed{min=0}$