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$f(x)=\begin{cases}\sqrt{x-x^2} & x>0\\ \sqrt{x+x^2} & x<0\end{cases}$ $\quad f'(x)=\begin{cases}\frac{1-2x}{\sqrt{x-x^2}} & x>0\\ \frac{1+2x}{\sqrt{x+x^2}} & x<0\end{cases}$ $\quad x=\frac{1}{2}$ ✓ $\quad x=-\frac{1}{2}$ ✗

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$f'(x)=\frac{1}{2\sqrt{x}}-\frac{1}{\sqrt{a-2x}}=0$ $\quad x=a/2$ $\quad a/4$

$f(0)=\sqrt{a}$ $\quad f(\frac{a}{2})=\sqrt{\frac{a}{2}}$ $\quad f(\frac{a}{4})=\sqrt{\frac{3a}{2}}$

$\sqrt{\frac{3a}{2}}\sqrt{\frac{a}{2}}=12$ $\quad a=8$

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$f(x)=\frac{x^4-4x^2}{x^2-1}$ $\quad f'(x)=\frac{2x(x^4-2x^2+4)}{(x^2-1)^2}=0$ $\quad x=0$

نقاط داخل قدرمطلق

$\{-2,0,2\}$ $\quad f'(0)=0$

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$y'=3ax^2+2bx+C$ $\quad x=0$ $\quad C=0$

$y^*=ax^3+bx^2+cx+d$ $\quad x=1$ $\quad 3a+2b=0$

$\begin{cases}a+b=1\\ 3a+2b=0\end{cases}$ $\quad a=-2$ $\quad b=3$

$x=0$ $\quad d=0$ $\quad x=1$ $\quad a+b=1$

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$-\sqrt{3}<x<\sqrt{3}$ $\quad 3-x^2>0$

$f(x)=3x-x^3$

$f'(x)=3-3x^2$ $\quad 3-3x^2=0$ $\quad x=\pm1$

$x=1$ $\quad f(x)=2$

$x=-1$ $\quad f(x)=-2$ $\quad$ مطلق min

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$y'=3x^2+2ax$ $\quad x=-1$ $\quad 3-2a=0$ $\quad a=\frac{3}{2}$

$y=x^3+x+ax^2+b$ $\quad -1+\frac{3}{2}+b=1$ $\quad \frac{3}{2}+b=0$ $\quad b=-\frac{3}{2}$

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

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$y'=2x+1$ $\quad 2x+1=0$ $\quad x=-\frac{1}{2}$ $\quad \frac{-a-1+2a-3}{3}=0$ $\quad a=4$

ext $=\max\left|\begin{matrix}-1/3\\ 2/3\end{matrix}\right.$

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

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$y = \frac{6x^2+7}{4x^2+ax+1}$ $A\begin{cases} -1/2 \to \text{مجانب قائم} \\ 3 \to \text{مجانب افقی} \end{cases}$ $\frac{b}{a}(-3)$

$4(\frac{-1}{2})^2 + a(\frac{-1}{2}) + 1 = 0 \quad a = 4 \quad \frac{b}{4} = 3 \quad b = 12$

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

y': $+$ (0) $-$ (2) $-$ ($2\sqrt[3]{4}$) $+$

y: ↗ ↘ ↘ ↗

$(2\sqrt[3]{4}-2)$

$f(x) = \frac{x^4-3}{x^2-3} \quad = \frac{4x^3(x^2-3) - (2x)(x^4-3)}{(x^2-3)^2}$