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

۱

$f(1) = 1 - a \quad f(3) = 1 - \frac{a}{3} \quad \frac{f(3)-f(1)}{3-1} = \frac{\frac{2a}{3}}{2} = \frac{a}{3}$

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

۲

$y' = 4ax - 5 = 1 \rightarrow x = \frac{3}{2a}$

A | x | x
$x < 0 \rightarrow a < 0$
$\frac{3}{2a}$
$\frac{3}{2a}$

$\frac{3}{2}a = 2a \times \frac{9}{4a^2} - \frac{5 \times 3}{2a} + 18a \rightarrow 9a^3 = 18a - 30a + 72a^3$

$99a^3 - 12a = 0 \rightarrow 9a(11a^2 - 2)$
$a = 0$
$a = \pm\sqrt{\frac{2}{11}} \rightarrow a = -\sqrt{\frac{2}{11}}$

۳

$y' = 3x^2 - 12 \rightarrow 3x^2 - 12 = 0 \rightarrow x = \pm 2$

x		-2		$+2$	
y'	$+$	0	$-$	0	$+$
y	↗	18	↘	-14	↗

-14 → Min نسبی

۴

$y' = 3x^2 + 2ax - 2b$

$3(0) + 2a(0) - 2b = 0 \rightarrow b = 0$

$3(-2)^2 + 2a(-2) - 2b = 0 \rightarrow 12 - 4a = 0 \rightarrow a = 3$

$y = x^3 + 3x^2 - 4$

$x = 0 \rightarrow y = -4$

$x = -2 \rightarrow y = -8 + 12 - 4 = 0$

$\sqrt{(-4-0)^2 + (0+2)^2} = \sqrt{16+4} = 2\sqrt{5}$

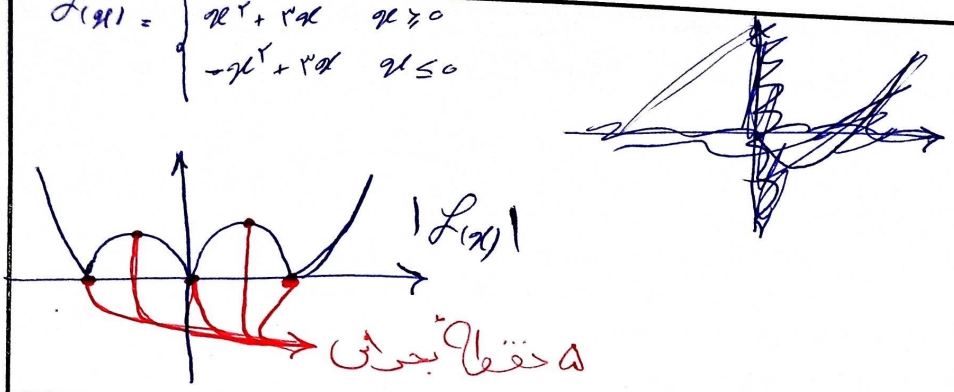
۵

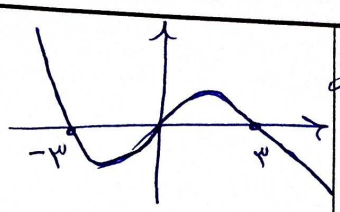
$x^2 - 5x$ → $x^2 - 5|x|$ → Max Max Min Min Min

$m = 2 \quad n = 3 \quad \frac{n}{m} = \frac{3}{2}$

۶

$$f(x)=\begin{cases} x^2+2x & x\ge 0 \\ -x^2+2x & x<0 \end{cases}$$



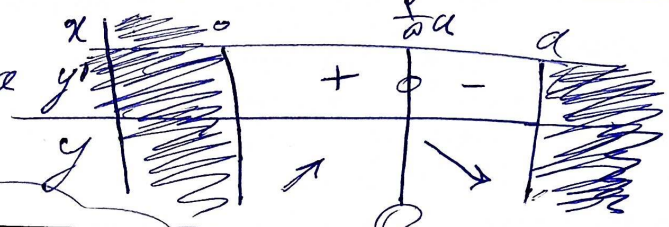


۷

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

$$x=0$$

$$-3x^2=-2x+2a \Rightarrow x=\frac{2}{3}a$$



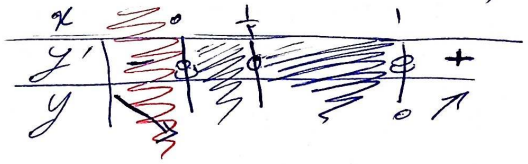
Max

$$\frac{2}{3}a=\frac{4}{5} \rightarrow a=\frac{6}{5}$$

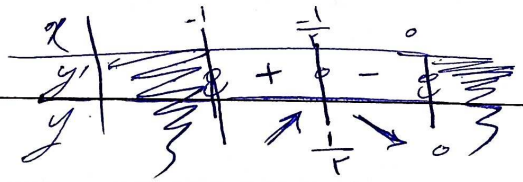
$$f(x)=\begin{cases} \sqrt{x^2-x} & x\ge 0 \\ \sqrt{-x^2-x} & x<0 \end{cases}$$

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

$x>0$ →



$x<0$ →



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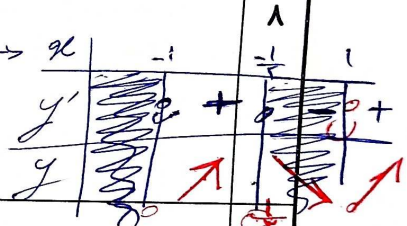


Max نسبی ← نقطه بحرانی

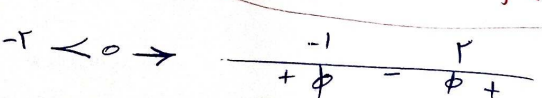
۰ و $-\frac{1}{2}$ ← ۳ عدد بحرانی

۹

$$\frac{3\times 1+5}{5-3}=1$$

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

$$-m^2-m-2<0 \rightarrow$$



؟ اعداد -1 ، 0 ، 1

سه مقدار

$$x<0 \rightarrow y=\frac{x}{x^2+1} \rightarrow y'=\frac{(x^2+1)-x(2x)}{(x^2+1)^2}=\frac{-x^2+1}{(x^2+1)^2}$$

$$-x^2+1=0 \rightarrow x^2=1 \rightarrow x=\pm 1$$

غ ق ق

$$x<0 \rightarrow x=-1$$

$$x\ge 0 \rightarrow y=\frac{x}{x^2-x+1} \rightarrow y'=\frac{(x^2-x+1)-x(2x-1)}{(x^2-x+1)^2}=\frac{-x^2+1}{(x^2-x+1)^2}$$

$$x\ge 0 \rightarrow x=1$$

۱۰

$$x=\begin{cases} -1 \\ 1 \end{cases}$$

← یک نقطه بحرانی