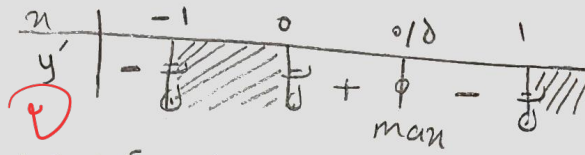


تکلیف شماره ۲۴

پارسی بنی زاده - دوازدهم دختر B

$x(1-|x|) \geq 0$ $D = (-\infty, -1] \cup [0, 1]$ (۱)

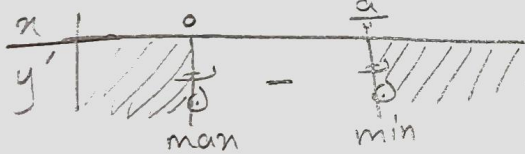
$f = \sqrt{x+x^2}$ $f' = \frac{1+2x}{2\sqrt{x+x^2}} \rightarrow x = -\frac{1}{2}$ $\rightarrow n = -1, 0$	$f = \sqrt{x-x^2}$ $f' = \frac{1-2x}{2\sqrt{x-x^2}} \rightarrow x = \frac{1}{2}$ $\rightarrow n = 0, 1$
---	---



$k = \{-1, 0, 1/2, 1\}$
 $m = \{0, 1/2\}$ $n = \emptyset$

$m+n+k = 1+0+0 = 1$

$f' = \frac{1}{2\sqrt{x}} - \frac{x'}{x\sqrt{a-2x}} = \frac{\sqrt{a-2x} - 2\sqrt{x}}{2\sqrt{x}\sqrt{a-2x}} \rightarrow x=0, \frac{a}{4}$ (۲)

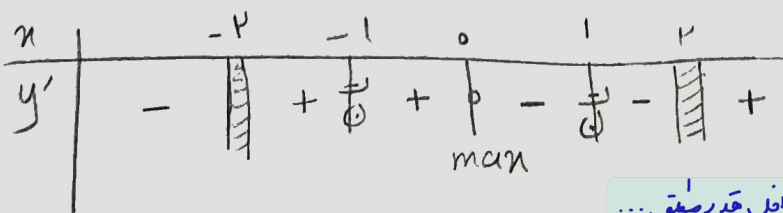


$Df = [0, \frac{a}{4}]$
 $\max = \sqrt{a}$ $\min = \sqrt{\frac{a}{4}}$

$\sqrt{a} \times \sqrt{\frac{a}{4}} = \frac{a}{\sqrt{4}} = \sqrt{4} \Rightarrow a = 2\sqrt{4} \approx 2.828 \dots [a] = 2$

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

$f'_+(2) = \frac{14}{2}$	$f'_-(2) = \frac{-14}{2}$	n=2 مثبت میگیرد
$f'_+(-2) = \frac{14}{2}$	$f'_-(-2) = \frac{-14}{2}$	n=-2 مثبت میگیرد



تابع در $n=0$ فقط
 استریم دارد ✓

$$f' = \mu a x^r + r b x + c \quad (E)$$

$$f'(0) = 0 \Rightarrow f'(0) : c = 0 \quad f(0) = 0 \Rightarrow d = 0$$

$$f'(1) = 0 \Rightarrow \mu a + r b = 0 \quad f(1) = 1 \Rightarrow a + b = 1$$

$$a = -r \quad b = r \quad ab = -4 \quad \ominus$$

$$x = [-1/\mu, \sqrt{\mu}] \rightarrow \mu - x^2 \geq 0 \quad f = \mu x - x^{\mu} \quad (D)$$

$$f' = \mu - \mu x^{\mu-1} = 0 \quad x = \pm 1$$

x	$-1/\mu$	-1	$+1$	$\sqrt{\mu}$
y'		$-$	$+$	$-$
		\ominus min	\oplus max	

$$x = -1 \rightarrow y = -r \quad \text{min} \quad x = \sqrt{\mu} \rightarrow y = 0 \quad \text{min} \quad (-1, -r) \text{ نقطة}$$

$$f(-1) = 1 \rightarrow y = 1 + \mu a + b = 1 \quad \mu a + b = 0 \quad (4)$$

$$f'(-1) = 0 \quad f' = -\mu x^{\mu-1} + \mu a x \rightarrow -\mu - \mu a = 0$$

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

$$f = \frac{\mu}{\mu} x^{\mu} + x + \frac{1}{\mu} \rightarrow f' = \mu x + 1 = 0 \quad x = \frac{-1}{\mu} \quad y = \frac{\mu}{\mu} \quad (V)$$

$$y = \frac{a x + \mu}{(a+1)x + a - 1}$$

I جانب $\rightarrow x = \frac{1-a}{a+1} = \frac{-1}{\mu}$

II جانب $\rightarrow y = \frac{a}{a+1} = \frac{\mu}{\mu} \Rightarrow a = \mu$

$y = \frac{\mu x + \mu}{\mu x + 1} = 0 \quad \mu x = \frac{-\mu}{\mu} \quad \text{نقطة التقاط } (\frac{-\mu}{\mu}, 0)$

$$\text{كسب} = x = \frac{-1}{\mu} \Rightarrow \text{مخرج} = \epsilon \left(x + \frac{1}{\mu}\right)^2 = \epsilon x^2 + \epsilon x + 1$$

$$\Rightarrow a = \epsilon$$

$$\lim_{x \rightarrow \infty} f(x) = \mu = \frac{b x^{\mu}}{\epsilon x^{\mu}} \quad b = 1 \quad \frac{b}{a} = \mu$$

$$f' = \frac{\varepsilon x^{\mu} (x^{\mu} - \lambda) - \mu x^{\mu} (x^{\varepsilon})}{(x^{\mu} - \lambda)^{\mu}} = \frac{x^{\mu} - \mu x^{\mu}}{(x^{\mu} - \lambda)^{\mu}} \quad (9)$$

$x = 0, \sqrt[3]{3\mu}$

$x = 2 \quad \mu =$

x		0	2	$\sqrt[3]{3\mu}$	
y'	+	0	-	-	+

$$D_f = \mathbb{R} - \{2\}$$

تابع در $(2, \sqrt[3]{3\mu}) \cup (0, 2)$ ابتدا نزولی است -
 ← طول بازه = 2
 ← طول بازه ≈ 1.17
 ← طول بازه = $\sqrt[3]{3\mu} - 2$

$$D_f = \mathbb{R} - \{\pm\sqrt{\mu}\}$$

(10)

$$f' = \frac{\varepsilon x^{\mu} (x^{\mu} - \mu) - \mu x^{\mu} (x^{\varepsilon} - \mu)}{(x^{\mu} - \mu)^{\mu}} = \frac{\mu x^{\mu} (x^{\varepsilon} - 4x^{\mu} + \mu)}{(x^{\mu} - \mu)^{\mu}} \rightarrow \pm\sqrt{\mu}$$

$$x^{\varepsilon} - 4x^{\mu} + \mu = 0$$

$$x^{\mu} = \frac{4 \pm \sqrt{16}}{2} = \mu \pm \sqrt{4}$$

$$x = \pm \sqrt{\mu \pm \sqrt{\mu}}$$

x	$-\sqrt{\mu + \sqrt{\mu}}$	$-\sqrt{\mu}$	$-\sqrt{\mu - \sqrt{\mu}}$	0	$\sqrt{\mu - \sqrt{\mu}}$	$\sqrt{\mu}$	$\sqrt{\mu + \sqrt{\mu}}$
y'	-	+	+	-	-	+	+

$$(-2, 2)$$

در این بازه، ابتدا نزولی داریم

$$[-\sqrt{\mu - \sqrt{\mu}}, 0] \cup [\sqrt{\mu - \sqrt{\mu}}, \sqrt{\mu}) \cup (\sqrt{\mu}, 2)$$

$$f(x) = \pm \frac{x^2(x^2-2)}{x^2-1} \rightarrow f'(x) = \pm \frac{(4x^3-2)(x^2-1) - (x^4-2x^2)2x}{(x^2-1)^2} = 0 \quad -3$$

$$\pm(4x^3 - 4x^2 + 2x) = 0 \rightarrow x=0$$

$$\rightarrow x^4 - 2x^2 + 2 = 0 \quad (\text{ریشه ندارد})$$

تعداد ۲، ۲ - ریشه‌های دگرمتعلق و تعدادی ضریب‌های مساوی است پس 3 نقطه‌ای هم‌بندی دارد!

$$f(x) = \sqrt{x} + \sqrt{a-2x} \rightarrow Df \quad \cdot \leq x \leq \frac{a}{2} \quad 2$$

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

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

$$x = \frac{a}{4} \rightarrow f\left(\frac{a}{4}\right) = \frac{\sqrt{a}}{\sqrt{2}} \quad \text{نقطه min}$$

$$x = \frac{a}{4} \rightarrow f\left(\frac{a}{4}\right) = \sqrt{\frac{a}{4}} + \sqrt{\frac{4a}{4}} = \frac{\sqrt{a}}{2} + \sqrt{a} = \frac{3\sqrt{a}}{2} \quad \text{نقطه max} \quad \left. \begin{array}{l} \text{max} \\ \text{min} \end{array} \right\} \frac{3x a}{\sqrt{12}} = \sqrt{12} \rightarrow \boxed{a=4}$$