

تکلیف ۲۶

ارزش مطلق، دوارد  $A$   $\frac{1}{F}$   $k=4$

$$f(x) = \begin{cases} \sqrt{x(1-x)} & 1 > x > 0 \\ \sqrt{x(1+x)} & x \leq -1 \end{cases}$$

①  $k = \text{تعداد نقاط بحرانی} = (1, 0, -1) \text{ و } \frac{1}{F}$

$x = \frac{1}{F} = m$  (یک بیشیم نسبی دارد)

$0 = n$  (ماکسیم نسبی ندارد)

۱, ۱, ۱, ۱

$k + m + n = 5$

$f'(x) = \frac{1}{2\sqrt{x}} - \frac{1}{2\sqrt{1-x}}$



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

(جواب پایین صفحه)

$f(x) = \sqrt{x} + \sqrt{1-x} \rightarrow x \leq \frac{a}{2}$

$\rightarrow f(x) = \sqrt{x} + \sqrt{1-x} = 2\sqrt{x}$

$D_f = [0, \frac{a}{2}]$

$$f(x) = \begin{cases} \frac{-x^2(x^2-1)}{x^2-1} & -2 \leq x \leq 2 \\ \frac{x^2(x^2-1)}{x^2-1} & x \leq -2 \\ \frac{x^2(x^2-1)}{x^2-1} & x \geq 2 \end{cases}$$

$$f'(x) = \begin{cases} -\frac{2x^3 + 2x - 2x^3 + 2x}{(x^2-1)^2} & -2 \leq x \leq 2 \\ \frac{2x^3 + 2x - 2x^3 + 2x}{(x^2-1)^2} & x \leq -2 \\ \frac{2x^3 + 2x - 2x^3 + 2x}{(x^2-1)^2} & x \geq 2 \end{cases}$$

(جواب پایین صفحه)

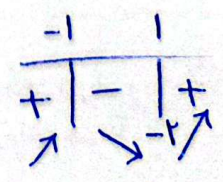
$\rightarrow y' = 2ax^2 + 2bx + c$   
 (0,0)  $\rightarrow c = 0$   
 (1,0)  $\rightarrow 2a + 2b = 0$

$y = ax^2 + bx + c + d \xrightarrow{(0,0)} d = 0$   
 (1,1)  $\rightarrow a + b + c = 1$

$ab = -9$

$a + b = 1 \rightarrow \begin{cases} 2a + 2b = 2 \\ 2a + 2b = 0 \end{cases} \rightarrow \begin{cases} b = 1 \\ a = 0 \end{cases}$

$x \in [-1, 2, 13] \rightarrow f(x) = x^3 - 2x \rightarrow f'(x) = 3x^2 - 2$



(1, -2) = min

$$y = x^p |x| + \sqrt{a} x^p + b \xrightarrow{(-1,1)} 1 = 1 + \sqrt{a} + b \rightarrow \boxed{\sqrt{a} + b = 0}$$

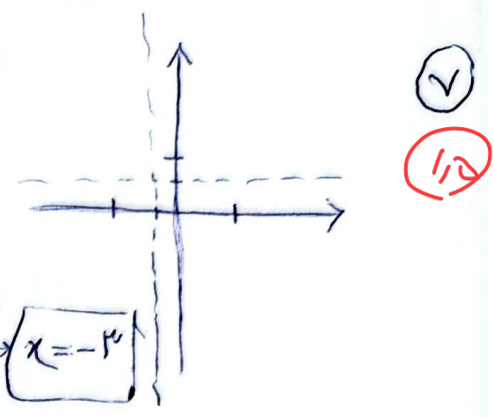
$$y' = -\sqrt{a} x^p + \sqrt{a} p x^{p-1} \xrightarrow{(-1,0)} -\sqrt{a} - \sqrt{a} p = \sqrt{a} + \sqrt{a} p = 0 \rightarrow \boxed{a = -\frac{1}{p}} \quad \boxed{b = \frac{\sqrt{a}}{p}}$$

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

$$y' = \sqrt{a} x + 1 \rightarrow x = -\frac{1}{\sqrt{a}} \quad y = \frac{\sqrt{a}}{\sqrt{a}} = 1 \quad T\left(-\frac{1}{\sqrt{a}}, \frac{\sqrt{a}}{\sqrt{a}}\right)$$

$$\frac{a}{a+1} = \frac{1}{p} \rightarrow \sqrt{a} = \sqrt{a+1} \rightarrow \boxed{a=1}$$

$$\rightarrow y = \frac{\sqrt{a+1}}{\sqrt{a+1}} \xrightarrow{y=0} \sqrt{a+1} = 0 \rightarrow \boxed{a = -\frac{1}{p}} \hookrightarrow y = \frac{x+\sqrt{a}}{\sqrt{a}x+1} \xrightarrow{y=0} \boxed{x = -\sqrt{a}}$$



$$\lim_{x \rightarrow \infty} \frac{bx^p + v}{\sqrt{a}x^p + ax + 1} = \sqrt{a} \rightarrow \boxed{b = \sqrt{a}}$$

$$\frac{1}{p} = \frac{1}{\sqrt{a}} \rightarrow 1 - \frac{a}{p} + 1 = 0 \rightarrow \boxed{a = \frac{1}{p}}$$

$\frac{b}{a} = \sqrt{a}$

$$\rightarrow f'(x) = \frac{p x^p (x^p - 1) - \sqrt{a} x^p (x^p)}{(x^p - 1)^2} = \frac{p x^p - \sqrt{a} x^p - \sqrt{a} x^p}{(x^p - 1)^2} = \frac{x^p - \sqrt{a} x^p}{(x^p - 1)^2}$$

•  $\sqrt{a} < x < \sqrt[p]{\sqrt{a}}$ ,  $a \neq 1$

•  $(1, \sqrt{a}) \rightarrow$   $0 < b < \sqrt{a}$

•  $(\sqrt{a}, \sqrt[p]{\sqrt{a}}) \rightarrow$   $0 < b < \sqrt{a}(\sqrt[p]{\sqrt{a}} - 1) < \sqrt{a}$

•  $\min$   $0 < b < \sqrt{a}(\sqrt[p]{\sqrt{a}} - 1)$

$$f'(x) = \frac{\sqrt{a} x^p (x^p - \sqrt{a}) - \sqrt{a} x (x^p - \sqrt{a})}{(x^p - \sqrt{a})^2} = \frac{\sqrt{a} x^p - \sqrt{a} x + \sqrt{a} x}{(x^p - \sqrt{a})^2} = \frac{\sqrt{a} x^p (x^p - \sqrt{a} + \sqrt{a})}{(x^p - \sqrt{a})^2}$$

$x \neq \pm \sqrt{a}$

$(-\infty, 0]$	$[\sqrt{a}, \sqrt{a}]$	$[\sqrt{a}, \sqrt{a}]$	$(\sqrt{a}, \sqrt{a})$	$(\sqrt{a}, \sqrt{a})$	$(\sqrt{a}, \sqrt{a})$
$-\{ -\sqrt{a} \}$	$\sqrt{a}$	$-\sqrt{a}$	$-\sqrt{a}$	$\sqrt{a}$	$\sqrt{a}$
$y'$	$-$	$+$	$-$	$+$	$-$

در بازه‌ها  $y' > 0$  و  $y' < 0$

$$f(x) = \sqrt{x} + \sqrt{a-2x} \rightarrow \begin{cases} x > 0 \\ a-2x > 0 \end{cases} \rightarrow x \leq \frac{a}{2} \rightarrow 0 \leq x \leq \frac{a}{2}$$

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

$$\begin{cases} x=0 \rightarrow y = f(0) = \sqrt{a} \\ x = \frac{a}{4} \rightarrow y = f\left(\frac{a}{4}\right) = \sqrt{\frac{a}{4}} \rightarrow \min \\ x = \frac{a}{2} \rightarrow y = f\left(\frac{a}{2}\right) = \sqrt{\frac{a}{2}} \rightarrow \max \end{cases}$$

$$\min \times \max = \sqrt{12} \rightarrow \sqrt[3]{\frac{a^3}{12}} = \sqrt{12} \xrightarrow{a^3 = 12 \times 12} \frac{a^3}{12} = 144$$

$$a^3 = 144 \rightarrow a = \sqrt[3]{144} \rightarrow [a] = 5$$

$$f(x) = \frac{x^2}{x^2-1} \quad |x^2-1| = \pm \frac{x^2(x^2-1)}{x^2-1} = \pm \frac{x^2-x^4}{x^2-1}$$

$$\rightarrow f'(x) = \pm \frac{(x^2-1)(2x) - (x^2-x^4)(2x)}{(x^2-1)^2} = \pm \frac{(x^2-1)(2x) - (2x^3-2x^5)}{(x^2-1)^2} = \pm \frac{(x^2-1)(2x) - (2x^3-2x^5)}{(x^2-1)^2}$$

$$\rightarrow \pm \frac{(x^2-1)(2x) - (2x^3-2x^5)}{(x^2-1)^2} = 0 \rightarrow \begin{cases} \pm 2x = 0 \rightarrow x = 0 \\ x^2 - 2x^3 + 1 = 0 \rightarrow x = \dots \end{cases}$$

استدلال اولی قابل قبول است  $\leftarrow \pm 2 \leftarrow \text{ext} \leftarrow \text{محدوده تعریف}$