

$$\left. \begin{aligned} \frac{f(r) - f(1)}{r - 1} &= \frac{1 - \frac{a}{r} - 1 + a}{r} = \frac{a}{r} \\ f'(r) &= -a \left(-\frac{1}{r^2}\right) = \frac{a}{r^2} \end{aligned} \right\} \frac{a}{r^2} = \frac{a}{r} \rightarrow r = \pm \sqrt{r} \rightarrow \begin{cases} r = -\sqrt{r} & \times \\ r = \sqrt{r} & \checkmark \end{cases} \quad (1/28)$$

$$y' = r a r - a = 1 \rightarrow r = \frac{r}{r a} \rightarrow y = r a \left(\frac{a}{r a r}\right) - \frac{1 a}{r a} + 1 a = 1 a - \frac{r}{a}$$

$$\rightarrow 1 a - \frac{r}{a} = \frac{r}{r a} \rightarrow r a = \frac{1}{r a} \rightarrow r a^2 = 1 \rightarrow a = \pm \frac{1}{r} \rightarrow a = \frac{-1}{r} \quad (1/28)$$

$a = \frac{1}{r} \rightarrow$ معادله مربع $\rightarrow x^2 - 4x + 4 = (x - 2)^2 = 0 \rightarrow$ ریشه مثبت

$$y' = 3r^2 - 12 \rightarrow f(r) = 12 - 4r + r = -1r$$

r	-2	2	
y'	+	-	+
y	↗	↘	↗

Max نسبی Min نسبی

(2)

$$y' = 3r^2 + 2ar - b$$

$n=0 \rightarrow -2b=0 \rightarrow b=0$

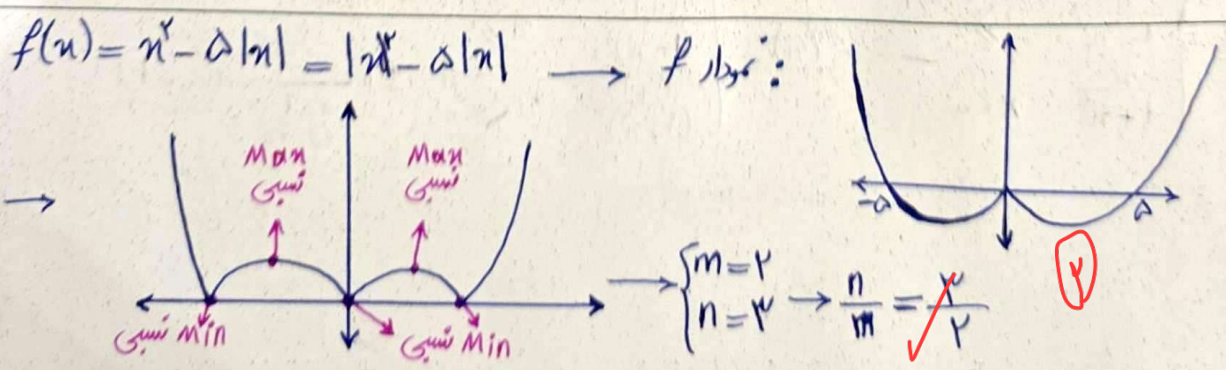
$n=-r \rightarrow 12 - 6a - 2b = 0 \rightarrow r=a$

$$\rightarrow y = r^3 + 3r^2 - r$$

$n=0 \rightarrow y = -r$

$n=-r \rightarrow y = 0$

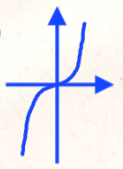
$$\rightarrow \sqrt{(0+r)^2 + (-r-0)^2} = \sqrt{2r^2} = r\sqrt{2} \quad (2)$$



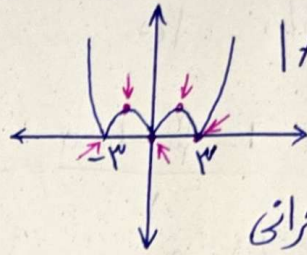
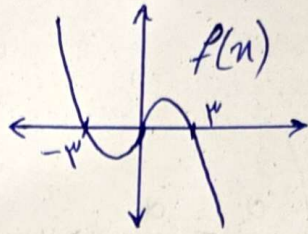
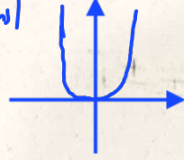
$$f'(x) = \begin{cases} \gamma x + \gamma & x > 0 \\ -\gamma x + \gamma & x < 0 \end{cases} \rightarrow f'(\cdot) = f'(\cdot) = \gamma$$

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

$f(x)$



$|f(x)|$



دایره برای

$$\rightarrow \text{نقطه بحرانی} = \alpha = 0$$

6

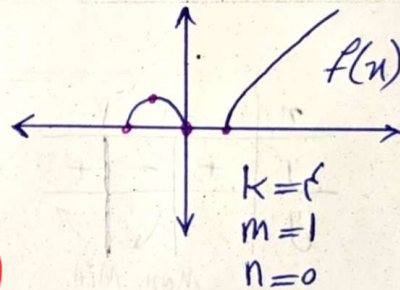
$$[0, \alpha) \rightarrow f(x) = (\alpha - x) \sqrt[\gamma]{x^\gamma} \rightarrow f'(x) = -\sqrt[\gamma]{x^\gamma} + \frac{\gamma(\alpha - x)}{\gamma \sqrt[\gamma]{x^\gamma}} = \frac{-\alpha x + \gamma \alpha}{\gamma \sqrt[\gamma]{x^\gamma}}$$

$$x = \alpha \rightarrow f'(x) = 0$$

$$\left. \begin{cases} f(x) = 1/\alpha = (\alpha - x) \sqrt[\gamma]{x^\gamma} \\ f'(x) = 0 = -\alpha x + \gamma \alpha \rightarrow \alpha = \frac{\alpha x}{\gamma} \end{cases} \right\} \rightarrow \frac{\gamma}{\gamma} = \frac{\gamma}{\gamma} x \sqrt[\gamma]{x^\gamma} = 1 \rightarrow x = 1 \rightarrow \alpha = \frac{\alpha}{\gamma}$$

7

$$f(x) = \begin{cases} \sqrt{x^k - x} & x \geq 0 \rightarrow D = [1, +\infty) \\ \sqrt{-x^k - x} & x < 0 \rightarrow D = [-1, 0] \end{cases}$$



$$\rightarrow \frac{km + n}{k - n} = \frac{\gamma + 0}{\gamma - 0} = 1$$

8

$$\begin{cases} k = \gamma \\ m = 1 \\ n = 0 \end{cases}$$

$$f'(x) = \frac{m(x-1+m) - (mx+\gamma)}{(x-1+m)^\gamma} = \frac{m^\gamma - m - \gamma}{(x-1+m)^\gamma} < 0$$

$$\text{عبارت} \rightarrow x = 1 - m \rightarrow 1 - m \leq 1 \rightarrow 0 \leq m$$

$$\text{حاصل} : (m - \gamma)(m + 1) < 0 \rightarrow \frac{-1}{+1} \frac{\gamma}{-1} \rightarrow -1 < m < \gamma$$

$$\left. \begin{cases} 0 \leq m < \gamma \\ \downarrow \\ m = 1 \\ m = 0 \end{cases} \right\} \text{9}$$

$$f(x) = \begin{cases} \frac{x}{1-x^\gamma} & x \geq 0 \\ \frac{x}{1+x^\gamma} & x < 0 \end{cases}$$

$$f'(x) = \begin{cases} \frac{x^\gamma + 1}{(1-x^\gamma)^\gamma} & x \geq 0 \\ \frac{-x^\gamma + 1}{(1+x^\gamma)^\gamma} & x < 0 \end{cases}$$

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

10

کلیک