

Subject:

Year:

Month:

Date:

14, 10

یازدهم رجب

تلفیظ شماره ۱۰

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$$f = \{ (3, 2), (n, \infty), (3, n^2 - n), (m, 2) \} \quad (1)$$

$$n^2 - n = 2 \Rightarrow n^2 - n - 2 = 0 \Rightarrow (n-2)(n+1) = 0$$

$$n = 2 \quad \text{یا} \quad n = -1 \quad \text{یا} \quad n = -1 \quad \text{یا} \quad n = 2$$

$$(3, 2) = (3, n^2 - n) = (m, 2) \Rightarrow m = 3$$

$$f = \{ (-1, 1), (1, 2), (2, 3), (a, m-1), (a+2, n) \}$$

$$(m, 3)$$

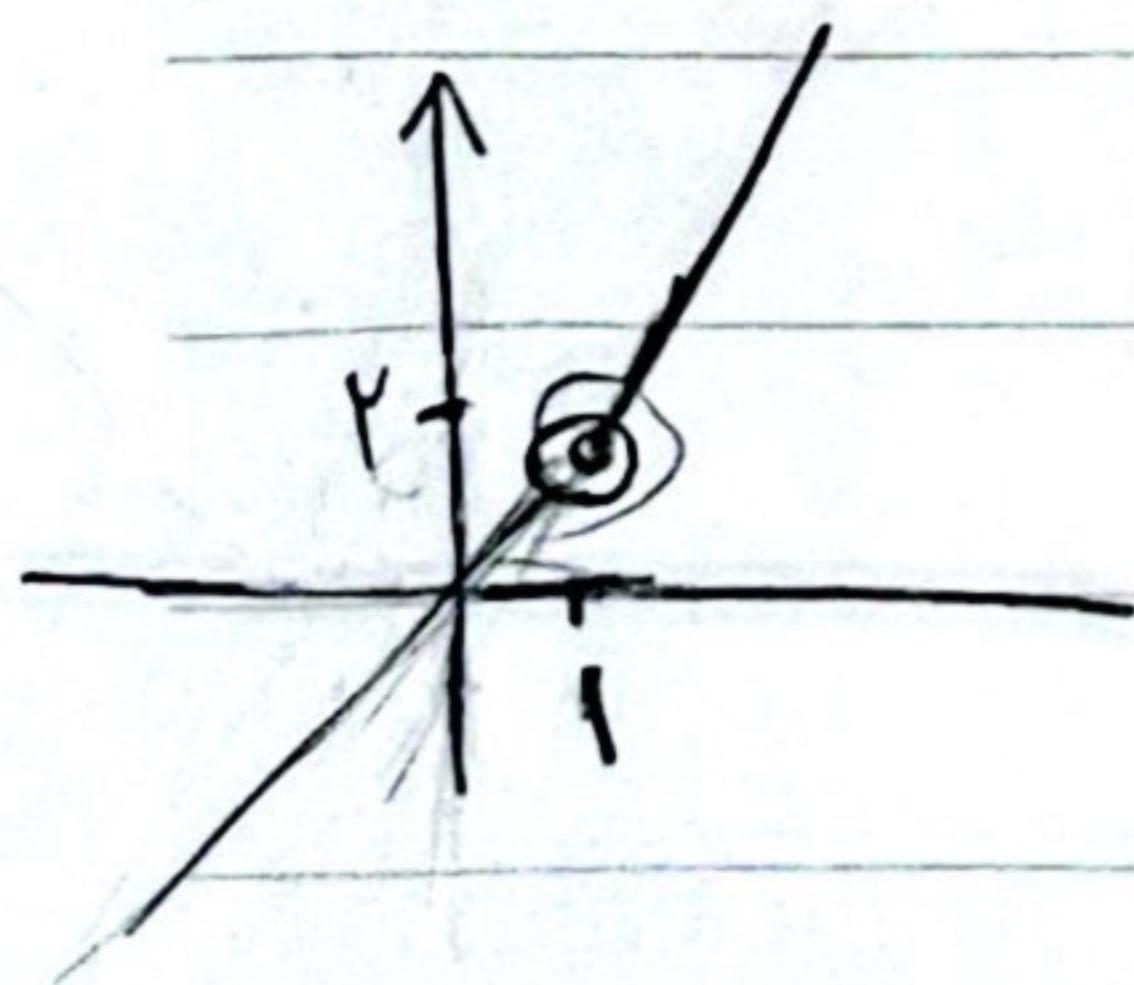
$$m = 2$$

$$a = -1 \Rightarrow n = 2$$

$$(2, 3) = (m, 3)$$

$$f(n) = \begin{cases} 3n+1 & ; n \geq 1 \\ n+a & ; n < 1 \end{cases}$$

حدود a زیر امانه $\perp$ را ندارد

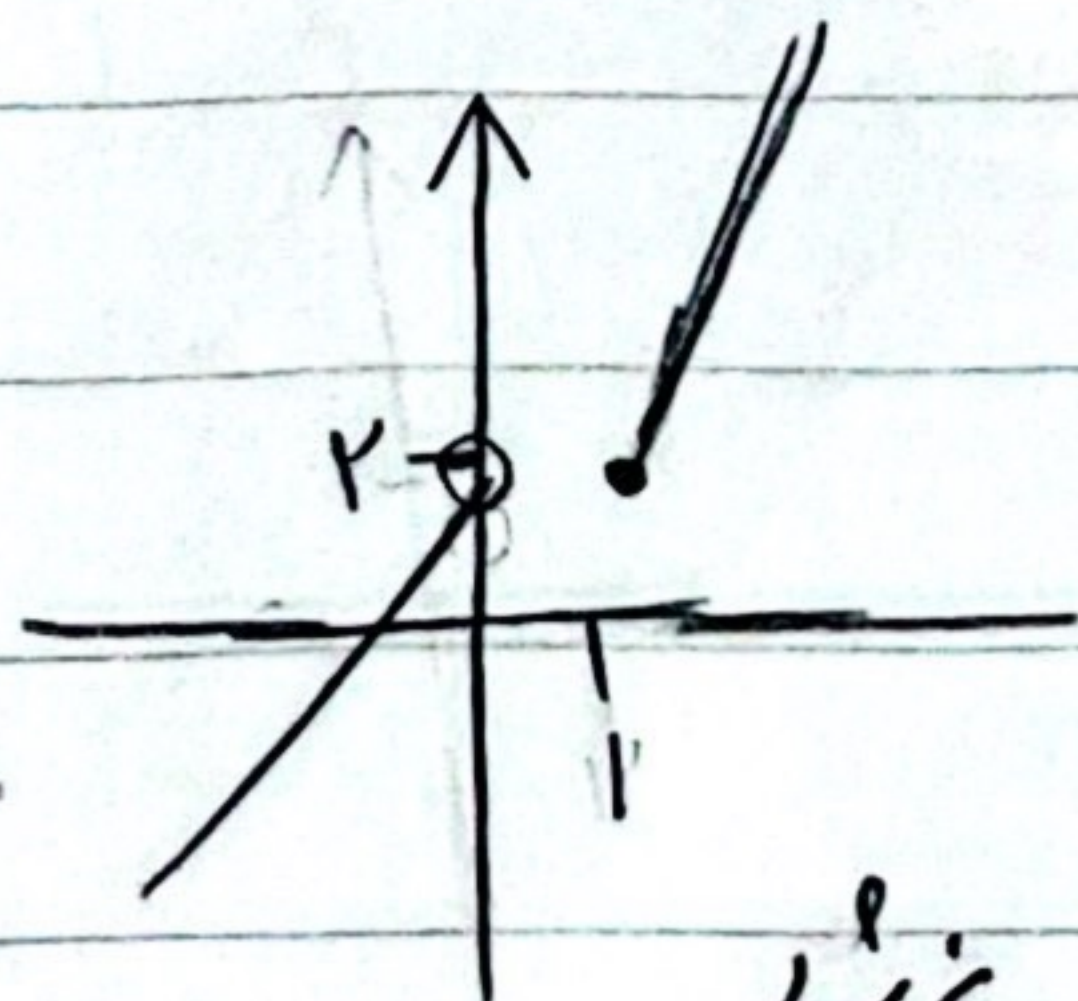


$$if \ n = 1 \Rightarrow 1+a \leq 2 \Rightarrow a \leq 1$$

$$a \in (-\infty, 1]$$

$$f(n) = \begin{cases} 3n-1 & ; n \geq 1 \\ a+2n-1 & ; n < 0 \end{cases}$$

(3)



$$\Rightarrow a > 0$$

$$if \ n = 0 \Rightarrow a-1 = f(n)$$

$$a-1 < 2$$

$$a < 3 \quad (II)$$

اگر a منفی باشد به یک به یک

SEVIL

(٤)

$$y = n^3 + 2 \quad \text{الف)}$$

$$n_1^3 + 2 = n_2^3 + 2 \Rightarrow n_1^3 = n_2^3 \Rightarrow n_1 = n_2$$

(ب) یک به یک است

$$n = y^3 + 2 \Rightarrow n - 2 = y^3 \Rightarrow y = \sqrt[3]{n-2} \quad \text{تابع معکوس}$$

$$y = n^2 - 8n + 2 \quad \text{ب)}$$

$$\Delta = (-8)^2 - 4(1)(2) = 16 - 8 = 8 > 0 \Rightarrow \Delta > 0$$

"یک به یک نیست"

(ج)

$$y = \frac{3n+1}{n-2} \quad \text{الف)}$$

ریشه شش توان معکوس افقی

$$n = \frac{3y+1}{y-2}$$

$$\frac{a}{c} = 3 \quad \text{مجاذب افقی}$$

$$2 = \text{مجاذب عمودی}$$

$$ny - 2n = 3y + 1$$

$$ny - 3y = 2n + 1$$

$$y(n-3) = 2n+1$$

$$y = \frac{2n+1}{n-3}$$

$$\Rightarrow -\frac{da-b}{cn-a} = -\frac{-2n-1}{n-3}$$

$$\Rightarrow y = \frac{2n+1}{n-3}$$

$$y = \frac{2+2n}{n+2} \Rightarrow y = \frac{2(n+1)}{(n+2)}$$

تابع یک به یک است

$$\text{الف) } y = \sqrt{n-3}$$

1,70

19

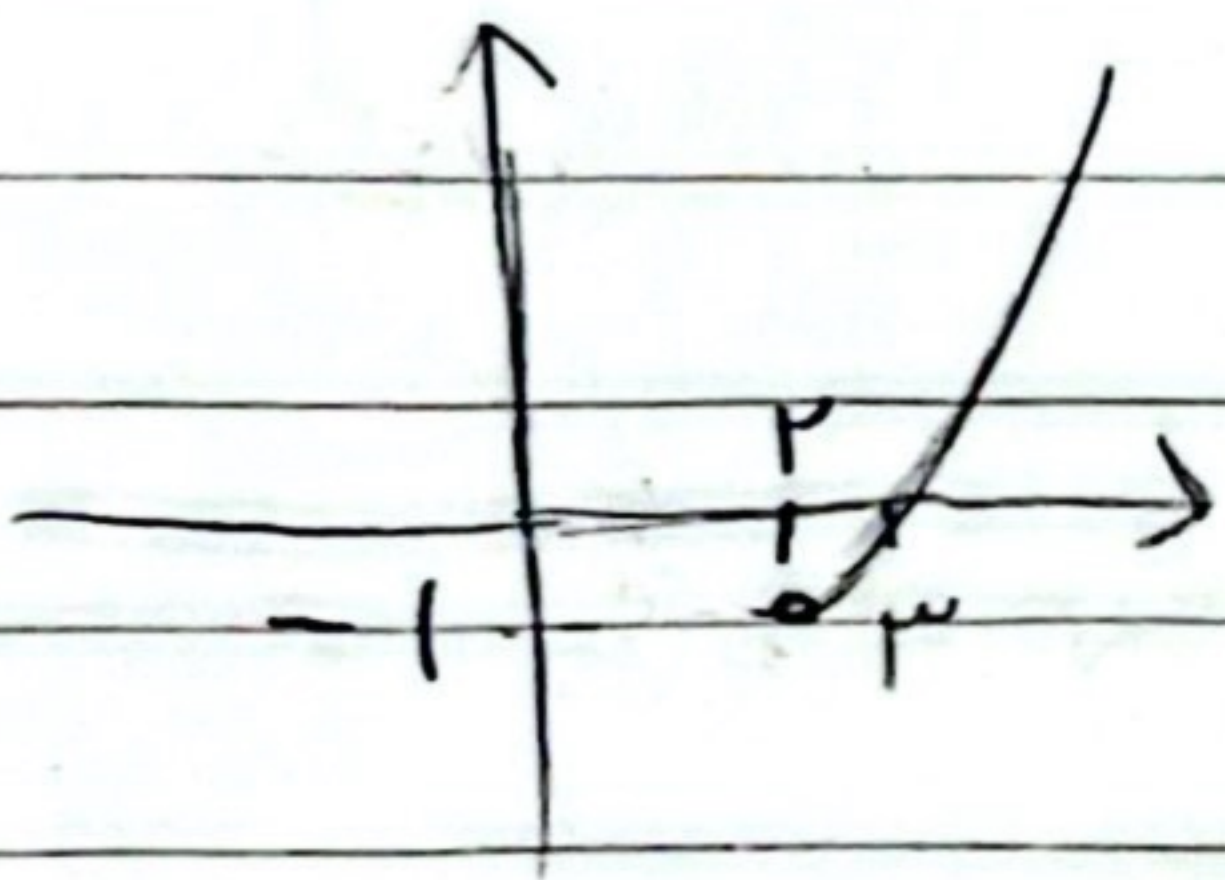
$$\sqrt{n_1-3} = \sqrt{n_2-3}$$

$$n_1-3 = n_2-3 \Rightarrow n_1 = n_2 \Rightarrow \text{تابع یک به یک است}$$

$$n = \sqrt{y-3} \Rightarrow n^2 = y-3 \Rightarrow y = n^2+3$$

$$\text{ب) } y = n^2 - 2n + 3, \quad n \in [2, +\infty)$$

$$(n-3)(n-1)$$



$\Rightarrow$ یک به یک است

$$\Rightarrow n = y^2 - 2y + 3$$

$$n = y^2 - 2y + 3 + 1 - 1$$

$$n+1 = (y-2)^2 \Rightarrow n = (y-2)^2 - 1$$

دامنه تابع $n \geq 2$ مر باشد پس برداریم $n \geq 2$ مر باشد

$$\pm \sqrt{n+1} = y-2 \Rightarrow y = 2 \pm \sqrt{n+1}$$

$$f(n) = n + \sqrt{n} \Rightarrow (0, +\infty)$$

$$f^{-1}(n) = an + b - \sqrt{n-c}$$

$$a+2b+2c = 1 \Rightarrow 1+1-1 = 1$$

$$n = y + \sqrt{y} \quad \sqrt{y} = t \Rightarrow n = t^2 + t \Rightarrow t^2 + t - n = 0$$

$$\Rightarrow t = \frac{-1 \pm \sqrt{1+4n}}{2} \quad \underline{t = \sqrt{y}, \sqrt{y} \geq 0} \quad t = \frac{-1 + \sqrt{1+4n}}{2}$$

$$\Rightarrow y = \left(\frac{-1 + \sqrt{1+4n}}{2} \right)^2 \Rightarrow an + b - \sqrt{n-c} = \frac{1+1+4n - 2\sqrt{1+4n}}{4}$$

$$\Rightarrow \frac{1}{2}an + \frac{1}{2}b - \frac{1}{2}\sqrt{n-c} = \frac{1}{4} + \frac{1}{2}n - \frac{1}{2}\sqrt{1+4n} \Rightarrow \frac{1}{2}\sqrt{n-c} = \frac{1}{2}\sqrt{1+4n} \Rightarrow \sqrt{n-c} = \sqrt{1+4n} \Rightarrow n-c = 1+4n \Rightarrow -c = 1+3n$$

$$\Rightarrow a=1, \quad b=\frac{1}{2}, \quad c=-\frac{1}{2}$$

$$y = \frac{n}{\sqrt{n^2 - r}} \quad (1)$$

$$\frac{n_1}{\sqrt{n_1^2 - r}} = \frac{n_r}{\sqrt{n_r^2 - r}} \Rightarrow \frac{n_1^2}{n_1^2 - r} = \frac{n_r^2}{n_r^2 - r} \Rightarrow \cancel{n_r^2 n_1^2} - r n_1^2 = \cancel{n_r^2 n_1^2} - r n_r^2$$

$$\Rightarrow r n_1^2 = r n_r^2 \Rightarrow n_1 = \pm n_r$$

فرض کنیم $n_1 = n_r$ (چون خروجی هوار است)

$$n = \frac{y}{\sqrt{y^2 - r}} \quad \text{مقلوب}$$

$$\Rightarrow n^2 = \frac{y^2}{y^2 - r} \Rightarrow n^2 y^2 - r n^2 = y^2$$

$$\Rightarrow n^2 y^2 - y^2 = r n^2 \Rightarrow y^2 (n^2 - 1) = r n^2 \Rightarrow y^2 = \frac{r n^2}{n^2 - 1}$$

$$\Rightarrow y = \pm \sqrt{\frac{r n^2}{n^2 - 1}} \quad \text{مقلوب } y, n \Rightarrow y = \frac{\sqrt{r} n}{\sqrt{n^2 - 1}}$$

$$g(n) = \sqrt{n} - 1$$

$$f^{-1}(n) = \frac{n}{1 + |n|} \quad (9)$$

$$f\left(-\frac{r}{\omega}\right) + g^{-1}\left(-\frac{r}{\omega}\right) = -\frac{r}{\omega} + \frac{q}{r\omega} = \frac{-\omega_0 + r\omega}{\omega} = \frac{-r\omega}{\omega} = -r = -\frac{r}{\omega}$$

①

$$-\frac{r}{\omega} = f^{-1}(n) \Rightarrow -\frac{r}{\omega} = \frac{n}{1 + |n|} \Rightarrow -r - r|n| = \omega n$$

if $n \neq |n|$ (یعنی منفی است) $\omega n + r n = -r \Rightarrow n = -\frac{r}{\omega + r}$

②

$$-\frac{r}{\omega} = g(n) \Rightarrow -\frac{r}{\omega} = \sqrt{n} - 1$$

⇓

$$\frac{r}{\omega} = \sqrt{n} \Rightarrow n = \frac{q}{r\omega} = g^{-1}\left(-\frac{r}{\omega}\right)$$

$$f^{-1}(n) = \sqrt[n-1]{n-1} \Rightarrow \textcircled{f(n)} \Rightarrow n = \sqrt[n]{y-1} \Rightarrow n^n = y-1 \quad (10)$$

$$f(n) = n^{n+1} \quad (1)$$

$$g(n) = f(n) + \sqrt{f(n)} = n^{n+1} + \sqrt{n^{n+1}}$$

$$g^{-1}(12) = ?$$

$$12 = n^{n+1} + \sqrt{n^{n+1}}$$

$$\downarrow$$

$$12 = g(n)$$

$$\underbrace{n^{n+1}}_{t^2} + \underbrace{\sqrt{n^{n+1}}}_t - 12 = 0$$

$$\uparrow$$

$$n^n = n \Rightarrow \textcircled{n=12}$$

$$t^2 + t - 12 = 0 \Rightarrow (t+4)(t-3) = 0$$

$$n^{n+1} = 9$$

$$c = \sqrt{n^{n+1}} = 3$$

$$L <$$

$$t = -4, t = 3$$