

$$F = \{(1, 2), (2, 5), (2, 2-n), (m, 2), (-1, 4)\} \quad \begin{matrix} m=2 \\ n \geq 2 \end{matrix}$$

$$\begin{matrix} (1, 2) \\ (2, 2-n) \end{matrix} \left\{ \begin{matrix} n \leq n=2 \\ \rightarrow n = \begin{cases} 2 \\ -1 \end{cases} \end{matrix} \right. \quad \checkmark$$

$$\begin{matrix} (1, 2) \\ (m, 2) \end{matrix} \left\{ \begin{matrix} m=2 \end{matrix} \right.$$

$$(-1, 4) \quad (-1, 5)$$

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

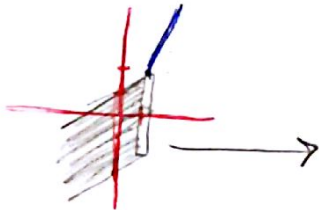
$$\begin{matrix} (2, 3) \\ (m, 2) \end{matrix} \left\{ \begin{matrix} m=2 \end{matrix} \right.$$

$$\begin{matrix} (1, 1) \\ (a, 1) \end{matrix} \left\{ \begin{matrix} a=2-1 \end{matrix} \right.$$

$$\begin{matrix} (1, 2) \\ (1, n) \end{matrix} \left\{ \begin{matrix} n \geq 2 \end{matrix} \right. \quad \checkmark$$

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

تابع یکدست

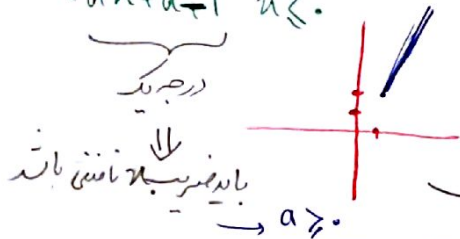


$$1+a \leq 2 \rightarrow a: (-\infty, 1] \quad \checkmark$$

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$$f(n) \begin{cases} 2n-1 & n \geq 1 \\ a+n+a-1 & n \leq 0 \end{cases}$$

تابع یکدست



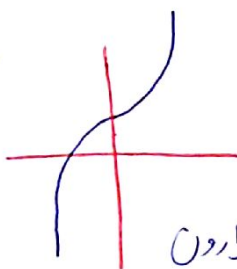
ماتریس سوال قبل

$$\begin{matrix} a(0)+a-1 \leq 2 \\ a \leq 3 \end{matrix} \rightarrow a: [0, 3] \quad \checkmark$$

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$$y = x^2 + 2$$

شکل



تابع یکدست

$$y = \sqrt[3]{9x-2} \quad \checkmark$$

$$y = x^2 - 5x + 2$$

$$y = x^2 - 5x + 5 - 3$$

$$y = (x-2)^2 - 2$$

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$$\begin{matrix} x = 3, 1 \\ y = -1 \end{matrix} \quad \checkmark$$

تابع یکدست

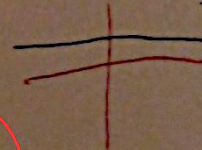
$$y = \frac{2n+1}{n-2}$$

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

$$R = \mathbb{R} - \{3\}$$

$$y = \frac{5+2n}{n+2} = 2$$

تابع یکدست



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شکل



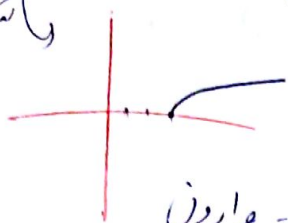
$$y = \frac{2n+1}{n-2} \quad \checkmark$$

الف: به ازای هر n که در D قرار دارد

تابع یکدست

$$y = \sqrt{u-1}$$

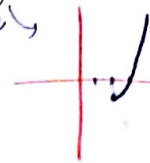
شکل



وارون: $y = u^2 + 1$ $u \in [0, +\infty)$

$$y = u^2 - 1 \quad u \in [1, +\infty)$$

شکل



تابع یکپارچه

وارون: $y = \sqrt{u+1} + 1$ $u \in [0, +\infty)$

$$f(u) = u + \sqrt{u} \quad \text{وارون} \quad f^{-1}(u) = au + b - \sqrt{u-c}$$

$y = u + \sqrt{u}$ وارون $u' = y' + \sqrt{y'}$ (1) $y = x + \frac{1}{y} - \sqrt{x + \frac{1}{y}}$

$$f(1) = 2$$

$$f(x) = x + \sqrt{x}$$

$$a=1 \quad b=\frac{1}{y} \quad c=-\frac{1}{y}$$

$$f'(1) = 1 \rightarrow 2a + b - \sqrt{1-c} = 1$$

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

$$a + 2b + c = 1$$

$$y = \frac{u}{\sqrt{u^2-1}} \rightarrow y = \frac{\sqrt{u}}{\sqrt{u^2-1}}$$

می‌تواند ضعیف باشد زیرا در این صورت ما نمی‌توانیم به توان 2 برسانیم

$$y = \frac{u_1}{\sqrt{u_1^2-1}}$$

$$\frac{u_1}{\sqrt{u_1^2-1}} = \frac{u_2}{\sqrt{u_2^2-1}}$$

یک و ضعیف تواند بود و مختلف علامت داشته باشد

$$y = \frac{u_2}{\sqrt{u_2^2-1}}$$

$$\frac{u_1^2}{u_1^2-1} = \frac{u_2^2}{u_2^2-1}$$

$$u_1^2 u_2^2 - 1 = u_1^2 u_2^2 - u_1^2 u_2^2$$

$$u_1 = \pm u_2$$

یک به یک است

$$f^{-1}(u) = \frac{u}{1+|u|}$$

$$\frac{-r}{\omega} = \frac{u}{1+|u|} \rightarrow \omega u = -r - r|u|$$

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

$$\frac{-r}{\omega} = \sqrt{u} - 1$$

$$\sqrt{u} = \frac{r}{\omega}$$

$$u = \frac{r^2}{\omega^2}$$

$$ru = -r$$

$$u = \frac{-r}{\omega}$$

$$ru = -r$$

$$u = \frac{-r}{\omega}$$

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

$$\frac{-r}{\omega} + \frac{r}{\omega} = \frac{-r+r}{\omega}$$

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

$$g^{-1}(x) = ? = 2$$

$$g(u) = f(u) + \sqrt{f(u)}$$

$$g(u) = u^2 + 1 + \sqrt{u^2 + 1}$$

$$12 = u^2 + 1 + \sqrt{u^2 + 1} \xrightarrow{t=u^2} t + \sqrt{t+1} = 11$$

$$t = 11$$

$$u^2 = 11 \rightarrow u = \sqrt{11}$$