

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

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

$$(a, 1), (-1, 1) \Rightarrow a = -1$$

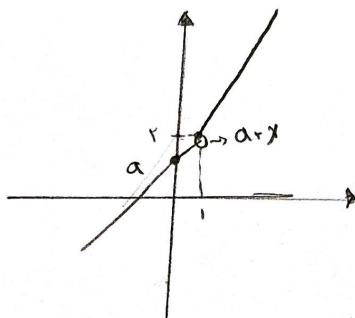
$$(1, 2), (1, n) \Rightarrow n = 2$$

$$f = \{(3, 2), (n, 5), (3, n^2-n), (m, 2), (-1, 4)\}$$

$$n^2 - n = 2 \Rightarrow n = +2 \text{ یا } -1$$

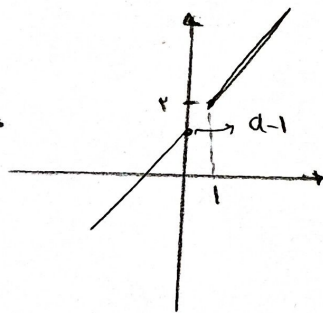
$$n \begin{cases} -1 \rightarrow (-1, 5), (-1, 4) \rightarrow \text{تابع نیست} \\ 2 \checkmark \end{cases} \quad (3, 2), (m, 2) \Rightarrow \begin{cases} m = 3 \\ n = 2 \end{cases}$$

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



$$\begin{cases} a < 2 \\ a < 1 \end{cases} \Rightarrow a < 1$$

$$f(x) = \begin{cases} x-1 & ; x \geq 1 \\ ax+a-1 & ; x < 1 \end{cases}$$

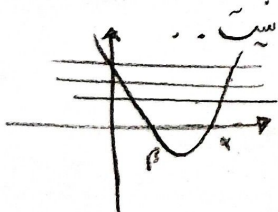


* سبب غی تواند منتهی ده باشد

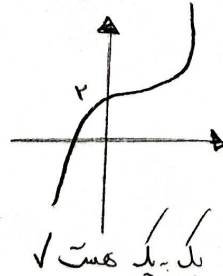
$$R_A = (-\infty, a-1]$$

$$\begin{cases} a-1 < 2 \Rightarrow a < 3 \\ a < 0 \end{cases} \Rightarrow a < 0$$

* چون تابع یک سگمی است و دامنه/خانی را تر آه



$$y = x^3 + 2 \xrightarrow{\text{مکس}} x = y^3 + 2$$



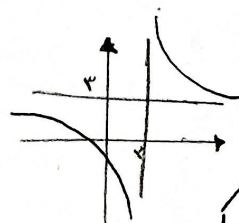
$$\begin{aligned} y^3 &= x-2 \\ y &= \sqrt[3]{x-2} \end{aligned}$$

یک-یک هست ✓

$$y = \frac{a \textcircled{2} x + \textcircled{4}}{c \textcircled{1} x + \textcircled{3} d}$$

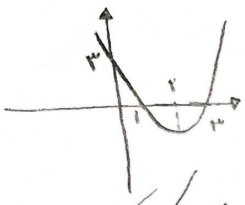
$$ad = bc \Rightarrow \text{تابع متباین است}$$

$$y = \frac{3x+1}{x-2} \xrightarrow{\text{مکس}} x = \frac{3y+1}{y-2}$$



$$\begin{aligned} xy - 2x &= 3y + 1 \\ xy - 3y &= 1 + 2x \\ y(x-3) &= 1 + 2x \\ y &= \frac{1+2x}{x-3} \end{aligned}$$

۱) $y = x^2 - 4x + 3, x \in [2, +\infty)$



$$x = y^2 - 4y + 3$$

$$x = (y-2)^2 - 1$$

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

$$y = 2 + \sqrt{x+1} \quad x \in [2, +\infty)$$

۲) $y = \sqrt{x-3} \xrightarrow{\text{مستقیم}} (x = \sqrt{y-3})$



$$x^2 = y-3$$

$$y = x^2 + 3$$

$f(x) = x + \sqrt{x} \xrightarrow{\text{مستقیم}} x = y + \sqrt{y} \Rightarrow \underbrace{y}_{b^2} + \underbrace{\sqrt{y}}_t = 0 \Rightarrow t^2 + t - x = 0$

$$a \cdot r \cdot b \cdot \varepsilon c = 1 + \varepsilon \left(\frac{1}{\varepsilon}\right) + \varepsilon \left(-\frac{1}{\varepsilon}\right)$$

$$\sqrt{y} - t = \frac{-1 \pm \sqrt{1+4x}}{2}$$

$$y = \left(\frac{-1 + \sqrt{1+4x}}{2} \right)^2 = \frac{1 + x + 4x - 2\sqrt{1+4x}}{4}$$

$$f^{-1}(x) = \sqrt{x} + \frac{1}{2} - \frac{1}{2} \sqrt{1+4x} \Rightarrow \sqrt{\frac{1}{\varepsilon} + x} \quad c = -\frac{1}{2}$$

$$\frac{x_1^2}{x_1^2-2} = \frac{x_2^2}{x_2^2-2} \Rightarrow x_1^2 x_2^2 - 2x_1^2 = x_2^2 x_1^2 - 2x_2^2 \Rightarrow x_1 = \pm x_2$$

یک می تواند، در حالت اول است با هم باشند

ع.ت.ک یک یک است

$$f(x) = \frac{x}{\sqrt{x^2-2}} \Rightarrow f^{-1}(x) = \left(x = \frac{y}{\sqrt{y^2-2}} \right)^2 = x^2 = \frac{y^2}{y^2-2} \Rightarrow x^2 y^2 - 2x^2 = y^2$$

$$x^2 y^2 - y^2 = 2x^2 \Rightarrow y^2 (x^2 - 1) = 2x^2 \Rightarrow y^2 = \frac{2x^2}{x^2-1} \Rightarrow y = \pm \sqrt{\frac{2x^2}{x^2-1}}$$

$$f\left(-\frac{r}{\delta}\right) = x = \left\{ \begin{array}{l} g^{-1}\left(-\frac{r}{\delta}\right) = z \end{array} \right.$$

$$f^{-1}(x) = -\frac{r}{\delta}$$

$$g(z) = -\frac{r}{\delta} \Rightarrow \sqrt{z} - 1 = -\frac{r}{\delta} \Rightarrow \sqrt{z} = \frac{r}{\delta} \Rightarrow z = \frac{r^2}{\delta^2}$$

$$\frac{x}{1+|x|} = -\frac{r}{\delta} \Rightarrow \delta x = -r - r|x| \quad \left\{ \begin{array}{l} x > 0 \Rightarrow x = -\frac{r}{\delta} \\ x < 0 \Rightarrow x = \frac{r}{\delta} \end{array} \right.$$

$$x + z = -\frac{r}{\delta} + \frac{r^2}{\delta^2} = \frac{-\delta + r}{\delta^2} = \frac{-r}{\delta^2}$$

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

$$g(x) = 12$$

$$g(x) = f(x) + \sqrt{f(x)} \Rightarrow f(x) = 9$$

$$f^{-1}(x) = \sqrt{x-1}$$

$$\left\{ \begin{array}{l} f(x) = 9 \\ f^{-1}(9) = x \end{array} \right.$$

$$f^{-1}(9) = (2 = x)$$

$$t^2 + t - 12 = 0 \Rightarrow t = -4 \text{ یا } 3$$

$$g^{-1}(12) = 2$$