

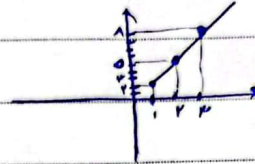
روز جمعه ۱۴۰۱/۰۵/۰۵ « شماره ۱ » « تلف ۱ »

$$n^2 - n \leq 2 \rightarrow n(n-1) \leq 2 \rightarrow n \leq 3 \Rightarrow \boxed{n \leq 3}$$

ب) $m \leq 2, a \leq -1, n \leq 2$

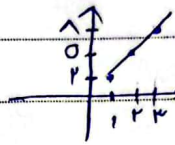
$$f(x) = \begin{cases} 3x-1, & x \geq 1 \\ x+a, & x < 1 \end{cases}$$

x	1	2	3
y	2	5	8



$$f(x) = \begin{cases} 3x-1, & x \geq 1 \\ ax+a-1, & x < 1 \end{cases}$$

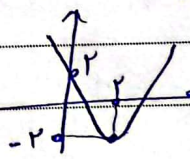
$$\begin{aligned} a-1 &< 2 \\ a &\leq 3 \\ (0, 3) \end{aligned}$$



نقطه اتصال را بررسی می‌کنیم
تابع باید یکپارچه باشد

الف) $y = x^3 + 2$ $\rightarrow$ $y = \sqrt{x-2}$

ب) $y = x^2 - 4x + 2$



الف) $y = \frac{3x+1}{x-2} \rightarrow x = \frac{y+1}{y-2} \rightarrow xy - 2y = 1 + 2x \rightarrow y(x-2) = 1 + 2x \rightarrow y = \frac{1+2x}{x-2}$

ب) $y = \frac{8+2x}{x+2} \rightarrow \frac{2x+8}{x+2} \rightarrow$ یکپارچه نیست

الف) $\sqrt{x-3}$ $\rightarrow$ $y = x^2 + 3$

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

$$(x-3)(x-1) \rightarrow x = (y-2)^2 - 1 \rightarrow (y-2)^2 = x+1 \rightarrow y = \sqrt{x+1} + 2$$

$$y = x + \sqrt{x} \quad \text{دالة} \quad x = y + \sqrt{y} \rightarrow y + \sqrt{y} - x = 0 \quad -V$$

$$\rightarrow \sqrt{y} = \frac{-1 \pm \sqrt{1+4x}}{2} \rightarrow \sqrt{y} \text{ دالة} \rightarrow \sqrt{y} = \frac{-1 + \sqrt{1+4x}}{2} \rightarrow y = \frac{1+4x+1-2\sqrt{1+4x}}{4}$$

$$\rightarrow \frac{1}{2} + x - \frac{1}{2} \sqrt{1+4x} \rightarrow \frac{1}{2} + x - \sqrt{\frac{1}{4} + x} \rightarrow \left. \begin{array}{l} a = \frac{1}{2} \\ b = \frac{1}{2} \\ c = -\frac{1}{2} \end{array} \right\} 1 + \frac{1}{2}x^2 + \frac{4x-1}{2} \quad (1)$$

$$y = \frac{x}{\sqrt{x^2-2}} \rightarrow \frac{\pm\sqrt{2}}{1} - \frac{\sqrt{2}}{1} \rightarrow D_f = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, +\infty)$$

$$x = \frac{y}{\sqrt{y^2-2}} \quad \text{دالة} \quad x^2 = \frac{y^2}{y^2-2} \rightarrow x^2 y^2 - 2x^2 y^2 \rightarrow x^2 y^2 - 2x^2$$

$$\rightarrow y^2 = \frac{2x^2}{x^2-1} \rightarrow y = \pm \sqrt{\frac{2x^2}{x^2-1}} \quad \left(y = \frac{x\sqrt{2}}{\sqrt{x^2-1}} \right)$$

$$\text{تقريب تابع به برعكس} \quad \left(\begin{array}{l} y_1 = y_2 \\ x_1 = x_2 \end{array} \right) \rightarrow \frac{x_1}{\sqrt{x_1^2-2}} = \frac{x_2}{\sqrt{x_2^2-2}} \rightarrow \frac{x_1\sqrt{2}}{\sqrt{x_1^2-2}} = \frac{x_2\sqrt{2}}{\sqrt{x_2^2-2}} \rightarrow \frac{x_1^2}{x_1^2-2} = \frac{x_2^2}{x_2^2-2}$$

$$\rightarrow x_1^2 = x_2^2 + 0, \text{ دالة} \quad (x_1 = x_2), \quad \text{هر دو متضادند} \rightarrow x_1 = -x_2$$

$$f^{(-1)}(x) = \frac{x}{1+|x|}, \quad g(x) = \sqrt{x} - 1$$

$$x \in \mathbb{R} \rightarrow f^{(-1)}(x) = \frac{x}{1+|x|} \rightarrow x = \frac{y}{1-y} \rightarrow x = y(1+x) \rightarrow y = \frac{x}{1+x}$$

$$f\left(-\frac{r}{8}\right) = \frac{-\frac{r}{8}}{\frac{r}{8}+1} = \frac{-r}{r+8}$$

$$g(x) = \sqrt{x} - 1 \rightarrow g'(x) = \frac{1}{2\sqrt{x}} \rightarrow x = \sqrt{y} - 1 \rightarrow x + 1 = \sqrt{y} \rightarrow y = (x+1)^2$$

$$g^{(-1)}\left(-\frac{r}{8}\right) = \left(-\frac{r}{8} + 1\right)^2 = \frac{9}{64} \rightarrow \frac{-r}{8} + \frac{9}{64} = \frac{-23}{64}$$

$$f^{-1}(x) = \sqrt[3]{x-1} \rightarrow x = \sqrt[3]{y-1} \rightarrow x^3 = y-1 \rightarrow y = x^3 + 1$$

$$g(x) = (x^3+1) + \sqrt{x^3+1} \rightarrow g(x) = 12 \rightarrow x^3+1 + \sqrt{x^3+1} = 12 \rightarrow x^3+1 = 9$$

$$g^{(-1)}(12) = (9)^{\frac{1}{3}} = 2 \quad \rightarrow \sqrt[3]{x^3+1} = 2 \rightarrow x^3+1 = 8 \rightarrow x^3 = 7 \rightarrow x = \sqrt[3]{7}$$

$$\sqrt{x^3+1} = 3 \rightarrow x^3 = 8 \rightarrow x = 2$$

$$(t+4)(t-3) = 0 \rightarrow t = -4 \text{ و } t = 3$$