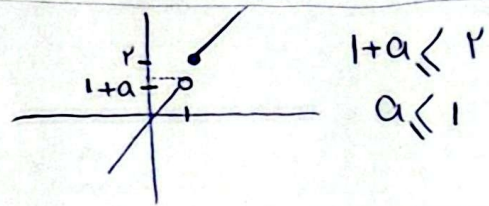


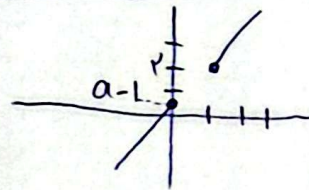
الف) $(3, 2) = (m, 2) \rightarrow m = 3 \rightarrow n^2 - n = 2 \rightarrow n^2 - n - 2 = 0 \rightarrow (n-2)(n+1) = 0$ $\begin{matrix} \rightarrow 2 \\ \rightarrow -1 \end{matrix}$ $\begin{matrix} \text{نقطه} \\ \text{عقده} \end{matrix}$ ①

ب) $(2, 3) = (m, 3) \rightarrow m = 2 \rightarrow (-1, 1) = (a, 1) \rightarrow a = -1 \quad n = 2$

الف) $f(x) = \begin{cases} 3x-1 & x > 1 \\ x+a & x < 1 \end{cases}$ $\begin{matrix} |1| & |0| & |3| \\ |1| & |0| & |1| \end{matrix}$ $\rightarrow y = 1+a$

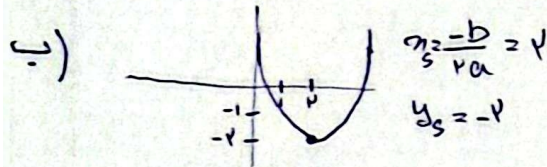


الف) $f(x) = \begin{cases} 3x-1 & x > 1 \\ ax+a-1 & x <= 0 \end{cases}$ $\begin{matrix} |1| & |0| & |3| \\ |1| & |0| & |1| \end{matrix}$



$a-1 < 2 \rightarrow a < 3$

الف) $x_1^3 + 2 = x_2^3 + 2 \Rightarrow x_1 = x_2 \quad f^{-1}(x) \Rightarrow x = y^3 + 2 \rightarrow y = \sqrt[3]{x-2}$ ②



چون به ازای x مقادیر یک مقدار y می دهد یک به یک نیست

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

ب) $y = \frac{2(x+2)}{(x+2)} \rightarrow y = 2$ تابع ثابت است و یک به یک نیست

الف) $f^{-1}(x) \Rightarrow x = \sqrt{y-3} \rightarrow x^2 = y-3 \rightarrow y = x^2 + 3$ ④

ب) $y = (x-2)^2 - 1 \rightarrow x = (y+1)^2 - 1 \rightarrow y = \sqrt{x+1} + 2 \Rightarrow f^{-1}(x)$
 $D_{f^{-1}} = [-1, +\infty), R_{f^{-1}} = [2, +\infty)$

الف) $f(x) = x + \sqrt{x} \quad f^{-1}(x) \Rightarrow y + \sqrt{y} = x \rightarrow y + \sqrt{y} + \frac{1}{4} = x + \frac{1}{4} \rightarrow x + \frac{1}{4} = (\sqrt{y} + \frac{1}{2})^2$ ⑤

$\sqrt{x + \frac{1}{4}} = \sqrt{y} + \frac{1}{2} \rightarrow \sqrt{y} = \sqrt{x + \frac{1}{4}} - \frac{1}{2}$ فقط جواب + را بکار ببریم قابل قبول است

$y = (\sqrt{x + \frac{1}{4}} - \frac{1}{2})^2 \rightarrow y = \frac{1}{4} + x - \sqrt{x + \frac{1}{4}} \rightarrow \frac{1}{4} + x - \sqrt{x + \frac{1}{4}} = ax + b - \sqrt{x - c}$

$a = 1 \quad b = \frac{1}{4} \quad c = -\frac{1}{4} \quad a + 2b + c = 1 + \frac{1}{2} - \frac{1}{2} = 1$

الف) $f(x_1) = f(x_2) \Rightarrow \frac{x_1}{\sqrt{x_1^2 - 2}} = \frac{x_2}{\sqrt{x_2^2 - 2}} \xrightarrow{\text{توان 2}} x_1^2 x_2^2 - 2x_1^2 = x_1^2 x_2^2 - 2x_2^2 \rightarrow x_1^2 = x_2^2 \rightarrow x_1 = \pm x_2$ ⑥

چون به توان 2 رسانیم جواب زائد داریم و رابطه یک به یک نیست

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

$$g(x) = \sqrt{x} - 1 = -\frac{v}{\omega} \rightarrow \sqrt{x} = \frac{v}{\omega} \rightarrow x = \frac{v^2}{\omega^2} \Rightarrow g^{-1}\left(-\frac{v}{\omega}\right) = \frac{v^2}{\omega^2}$$

$$\frac{x}{1+|x|} = -\frac{v}{\omega} \rightarrow -\omega x = v + v|x| \xrightarrow{x < 0} -\omega x = v - vx \rightarrow x = -\frac{v}{\omega} = f\left(-\frac{v}{\omega}\right)$$

$$\frac{v}{\omega} - \frac{v}{\omega} = \frac{v\omega - \omega^2}{\omega^2} = -\frac{v\omega}{\omega^2}$$

$$f^{-1}(x) \Rightarrow y = \sqrt{x-1} \rightarrow y^w = x-1 \rightarrow x = y^w + 1 \xrightarrow{\text{معكوس}} f(x) = x^w + 1$$

$$g(x) = x^w + 1 + \sqrt{x^w + 1} \rightarrow y = x^w + 1 + \sqrt{x^w + 1} \rightarrow x^w + 1 + \sqrt{x^w + 1} = 1v$$

$$x^w + \sqrt{x^w + 1} = 1 \Rightarrow x = v \rightarrow g^{-1}(1v) = v$$