

(۱) زوج است: $y = x + [x] \rightarrow [y] = 2[x]$: آلیا معدنی
 $f(x) = x + [x]$: آلیا معدنی

$f(x) = f^{-1}(x) \xrightarrow{\text{آلیا معدنی}} f(x) = x = x + [x] \rightarrow [x] = 0 \rightarrow x < 1$

(ب) $f \circ f^{-1}(x) = 2x - \frac{3}{2} \xrightarrow{x \in D_{f^{-1}}} x = 2x - \frac{3}{2} \rightarrow x = \frac{3}{2} \notin D_{f^{-1}}$

$D_{f^{-1}} = R_f = \left\{ \text{اعداد حقیقی با بخش صحیح} \right\}$

$[x] = 2k$

جواب ندارد

(۲) $y = \frac{ax+b}{cx+d} \rightarrow$ بجانب ما: $\frac{a}{c}, \frac{-b}{c} \rightarrow \frac{a}{c} = \frac{-b}{c} \rightarrow a+b=0$
 ادعای نمیکاریم تا به اول و دوم

$a+b=0 \xrightarrow{\forall x \in \mathbb{R}} f(x) = f^{-1}(x) \rightarrow f \circ f(x) = x \rightarrow f \circ f(5-\sqrt{5}) = 5-\sqrt{5}$

(۳) $f(x) = \frac{mx+3}{x+m+3} \rightarrow f^{-1}(x) = -\frac{(m+3)x-3}{x-m}$

$f(x) = f^{-1}(x) \rightarrow (m-x)(mx+3) = ((m+3)x-3)(x+m+3)$

$-mx^2 + (m^2-3)x + 3m = (m+3)x^2 + ((m+3)^2-3)x - 3(m+3)$

$\rightarrow (2m+3)x^2 + 3(2m+3)x - 3(2m+3) = 0$

$(2m+3)(x^2+3x-3) = 0 \rightarrow m = -\frac{3}{2}$ تابع با جملات مشترک را بر ویش از نقطه

$x^2+3x-3 = 0 \rightarrow \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{s}{p} = \frac{-3}{-3} = 1$ قطع داریم

(۴) $y = |2x+5| - |5x-2| \begin{cases} -3x+7 & x \geq \frac{5}{2} \\ 7x+3 & -\frac{5}{2} \leq x \leq \frac{5}{2} \\ 3x-7 & x < -\frac{5}{2} \end{cases}$

$f(x) = -3x+7 \quad x \geq \frac{5}{2}$
 $\geq \frac{5}{2} \rightarrow -3x+7 \leq \frac{29}{2}$

$f^{-1}(x) = \frac{7-x}{3} \quad x \leq \frac{29}{2}$

$$g(x) = \sqrt[3]{f(3x)-1} \xrightarrow{t=g(x)} t = \sqrt[3]{f(3g^{-1}(t))-1} \quad (5)$$

$$\frac{t+1}{\sqrt[3]{}} = f(3g^{-1}(t)) \rightarrow g^{-1}(t) = \frac{1}{\sqrt[3]{}} f^{-1}\left(\frac{t+1}{\sqrt[3]{}}\right)$$

$$\rightarrow a = \frac{1}{\sqrt[3]{}}, b = 1, c = \sqrt[3]{}, d = 0 \rightarrow \frac{ac+d}{\sqrt[3]{}b} = \frac{1}{\sqrt[3]{}}$$

$$f(x) = x + \sqrt{x} = (\sqrt{x})^3 + \sqrt{x} + 1 - 1 = (\sqrt{x} + 1)^3 - 1 = y \quad (6)$$

$$\sqrt{x} \geq 0 \rightarrow (\sqrt{x} + 1)^3 \geq 1 \rightarrow (\sqrt{x} + 1)^3 - 1 \geq 0 \rightarrow R_f = D_{f^{-1}} = [0, +\infty)$$

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

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

$[0, +\infty)$

$$y = \sqrt[3]{x} + x - 1 : \text{اکیلاً صعودی} : f(x) = f^{-1}(x) \rightarrow f(x) = x \quad (7)$$

$$\sqrt[3]{x} + x - 1 = x \rightarrow \sqrt[3]{x} = 1 \rightarrow x = 1$$

یک نقطه

$$f(x) = x^3 + 3x : \text{اکیلاً صعودی} \quad (8)$$

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

$$x \geq x^3 + 3x \rightarrow x^3 + 3x \leq 0 \rightarrow x(x^2 + 3) \leq 0 \rightarrow x \leq 0$$

$$\text{اعداد نامنفی} \xrightarrow{x \geq 0} \text{یک جواب نامنفی} : x \in \left\{ \frac{2}{3}, 0 \right\}$$

$$y = -x + \sqrt{x+3} \xrightarrow{x+y+3 \geq 0} x = -y + \sqrt{x+3} \rightarrow x+3 = -y + \sqrt{x+3} \rightarrow y \geq -3 \quad (9)$$

$$y = x - 3 \xrightarrow{x+3 = -(x-3) + \sqrt{x-3+3}} \sqrt{x+3} = \sqrt{x+1}$$

$$x^3 + 3x + 1 = x + 1 \rightarrow x^3 + 3x = 0$$

$$x(x^2 + 3) = 0 \rightarrow x = 0, \frac{-3}{x} \rightarrow y = -3, \frac{-10}{x}$$

$$x + y + 3 = 1, -3, 0 \geq 0 \rightarrow x = \frac{4}{3}$$

Subject _____

Date _____

$$\sqrt{x} + \sqrt{y} = Y \xrightarrow{\text{جدا}} \sqrt{y} + \sqrt{x} = Y \rightarrow f(x) = f^{-1}(x) \quad (1.)$$

$$f \circ f(x) = x \quad ; \quad x \in D_f = [0, Y]$$

$$-\sqrt{x} + Y = \sqrt{y} \rightarrow \sqrt{x} - Y \leq \sqrt{y} \leq \sqrt{x} + Y$$

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