



(الف) $x \in [0, 1]$

(۱۵)

(ب) $x \in x_p$, $f \circ f^{-1}(x) = x$ و $[0, 1]$ و $[-1, 0]$ $x_p =$

دوتا برابر هر عدد زوج تا عدد فرد بعدی است $x = 2x - \frac{3}{2} \rightarrow x = \frac{3}{2}$

جواب صحیح و معنادار $\rightarrow R_f$ و f^{-1} و $f \circ f^{-1}$

(۲) $f(x) = f^{-1}(x)$ $\frac{6}{x} = -\frac{b}{x} \Rightarrow \frac{6}{x} = -\frac{b}{x} \Rightarrow x = -b \rightarrow x + b = 0$

$f(x) = f^{-1}(x) \rightarrow -bx + 3 = 2x + b \rightarrow f \circ f^{-1}(5 - \sqrt{4}) \rightarrow f \circ f^{-1}(5 - \sqrt{4}) = 5 - \sqrt{4}$

(۳) $\frac{mx + 3}{x + m + 3} = x \rightarrow mx + 3 = x^2 + mx + 3x \rightarrow x^2 + 2x - 3 = 0$

$x^2 + 2x - 3 = 0$

$\frac{x+3}{x-1} = 1$

$\frac{c}{2} = -3$

$f(x) = |2x + 5| - |5x - 1|$

$\frac{-5}{x-1} = \frac{5}{x+1} \rightarrow -5(x+1) = 5(x-1) \rightarrow -5x - 5 = 5x - 5 \rightarrow -10x = 0 \rightarrow x = 0$

$R_f = (-\infty, \frac{29}{5}]$ و $D_f = [\frac{2}{5}, \infty)$

$f^{-1}(x) = x = -\frac{3}{y} + 1 \rightarrow y = \frac{-x+1}{3} \rightarrow D_f = x_p = (-\infty, \frac{29}{5}]$

$x \in (-\infty, \frac{29}{5}]$

(۵) $g(x) = T$ $T = 2f(3x) - 1 \rightarrow g(+)=x$

$f\left(\frac{t+1}{t}\right) = \frac{1}{t} \rightarrow f\left(\frac{t+1}{t}\right)^{-1} = 3x$ $f\left(\frac{t+1}{t}\right)^{-1} = 3g(f)^{-1} \rightarrow g(T)^{-1} =$

$\frac{f\left(\frac{t+1}{t}\right)^{-1}}{3} = \frac{ac+d}{3b}$ $c=2, b=1, a=\frac{1}{3}, d=0$

$\frac{1}{2} = -\frac{1}{2}$

صعودی آید (9)
 $f(x) = x + \sqrt{x} \Rightarrow x \geq 0 \Rightarrow Rf = Df \rightarrow [0, +\infty)$

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

$x \geq 0 \Rightarrow \sqrt{x} \geq 0 \quad f(x)^{-1} = (\sqrt{x+1} - 1)^2 \quad Df = Rf = [0, +\infty)$

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

صعودی آید (7)

$$f(x) = y \rightarrow f^{-1} = f \Rightarrow x - 1 + \sqrt{x} = x \Rightarrow x = 0$$

$$f(x)^{-1} \geq x \rightarrow f(x) \geq x \rightarrow x^2 + \sqrt{x} \leq x \rightarrow x^2 + \sqrt{x} \leq 0$$

(1)

$$\rightarrow x^2 + \sqrt{x} + 0 \leq 0 \rightarrow x \leq 0 \rightarrow x = 0$$

است

$$f(x) = -x + \sqrt{x+1} \quad Df = [-1, +\infty) \quad Rf = (-\infty, 1] \rightarrow$$

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

$$\rightarrow -(x-\sqrt{x}) + \sqrt{x-\sqrt{x}+1} = x + \sqrt{x}$$

$$f(x+1) = \sqrt{x+1} \rightarrow \sqrt{x+1} + \sqrt{x+1} = x+1 \quad x=0$$

شکل بر تابع ضروری پس یک جواب دارد

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

(10)

$$\Rightarrow Df^{-1} = \frac{\sqrt{y}}{2} = 2 - \sqrt{x} \quad x, y \geq 0$$

$$2 - \sqrt{x} \geq 0 \quad \sqrt{x} \leq 2 \Rightarrow x \leq 4$$

$$* y \Rightarrow 0 \leq x \leq 4$$

