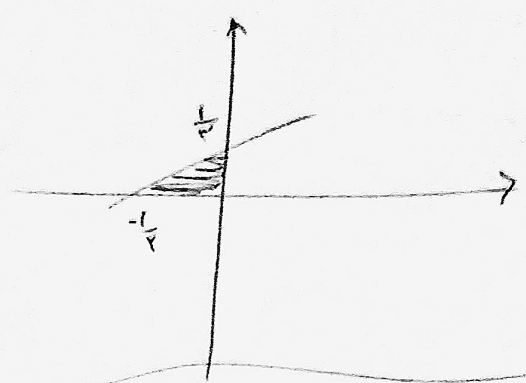


سوال ۱۰

$$2y = x - 1$$

سوال ۱۰

$$\Rightarrow y = \frac{x}{2} + \frac{1}{2} \Rightarrow \frac{x}{2} + \frac{1}{2} = 0 \Rightarrow x = -1$$



سوال ۱۱

الف) $y = x^2 - 2x + 3$, $x \in [1, +\infty) \Rightarrow y = x^2 - 2x + 1 + 2$
 $(x-1)^2$

$$\Rightarrow y - 2 = (x-1)^2 \Rightarrow \pm \sqrt{y-2} = x-1 \xrightarrow{\text{موجب } x \text{ و } y} y = \pm \sqrt{x-2} + 1$$

$$\Rightarrow f^{-1} = \sqrt{x-2} + 1 \text{ , } x \in [2, +\infty)$$

چون دنیای f برداشت f^{-1} برداشت $[1, +\infty)$ است

ب) $y = x^2 - 2x + 3$, $x \in [2, +\infty)$ $R_{f^{-1}} = [2, +\infty)$

$$\Rightarrow \sqrt{x-2} + 1 \geq 3 \Rightarrow \sqrt{x-2} \geq 2 \Rightarrow x-2 \geq 4 \Rightarrow x \geq 6$$

$$f^{-1} = \sqrt{x-2} + 1 \text{ , } x \in [6, +\infty)$$

$R_{f^{-1}} = P_f$ چون

سوال ۱۲

$$f(x) = 2x - \sqrt{14 - 4x(7-x)} \Rightarrow f(x) = 2x - \sqrt{14 - 14x + 4x^2}$$

$$\Rightarrow 2x - \sqrt{(2x-7)^2} = 2x - |2x-7| \xrightarrow{x \geq 7} 2x - (2x-7) = 7$$

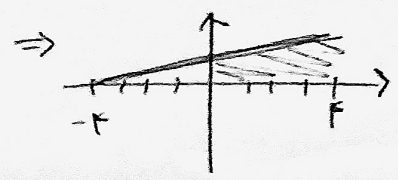
$(2x-7)^2$

$2x - 2x + 7 = 7$ $x \geq 7$

$2x + 7 - 7 = 2x - 7$ $x < 7$

$f^{-1} = f$ $f^{-1} = f$ $f^{-1} = f$

$$\Rightarrow y = 2x - 7 \rightarrow y + 7 = 2x \rightarrow \frac{1}{2}x + \frac{7}{2} = y \xrightarrow{f^{-1}} \frac{1}{2}x + \frac{7}{2} < 7 \Rightarrow \frac{1}{2}x < \frac{7}{2} \Rightarrow x < 7$$



$$\frac{(1+2) \cdot 7}{2} = 7 \leftarrow x + \infty \text{ و } 5$$

$$y = \frac{x}{\sqrt{x^2 - a}} \rightarrow y_1 = y_2 \rightarrow \frac{x_1}{\sqrt{x_1^2 - a}} = \frac{x_2}{\sqrt{x_2^2 - a}} \quad \text{سوال 4}$$

عوضه

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

$$\Rightarrow x_1^2 = x_2^2 \Rightarrow x_1 = \pm x_2 \Rightarrow x_1 = x_2 \quad \text{سوال 5} \quad \checkmark$$

$$y = \frac{x}{\sqrt{x^2 - a}} \Rightarrow y^2 = \frac{x^2}{x^2 - a} \rightarrow x^2 = \frac{a y^2}{y^2 - 1} \Rightarrow x = \pm \sqrt{\frac{a y^2}{y^2 - 1}} \quad \text{عوضه}$$

$$y = \frac{x}{\sqrt{x^2 - a}} \rightarrow f^{-1} = y = \pm \frac{|x| \sqrt{a}}{\sqrt{x^2 - 1}}$$

$$g(x) = \begin{cases} x^2 - 4x + 4 & x \geq 2 \rightarrow -\frac{b}{2a} = 2 \\ -x^2 + 4x + 4 & x < 2 \rightarrow -\frac{b}{2a} = 2 \end{cases}$$

سوال 5

$$1) \rightarrow x = 2 \rightarrow 2 - 4 + 4 = 2 - 4$$

$$\rightarrow 2 + 2x < 2 - 4 \Rightarrow 2x < -4$$

$$2) \rightarrow x = 2 \rightarrow -2 + 4 + 4 = 2 + 4$$

$$\Rightarrow x < -2$$

$$fx + |x| = y \rightarrow fx \leq x \leq 0 \Rightarrow y = fx \rightarrow x = \frac{y}{f} \quad x \geq 0 \quad \text{سوال 6}$$

$$\rightarrow fx \leq x < 0 \Rightarrow y = fx \Rightarrow x = \frac{y}{f} \quad x < 0$$

$$\rightarrow f^{-1} = \begin{cases} \frac{x}{f} & x \geq 0 \\ \frac{x}{f} & x < 0 \end{cases} \rightarrow ax + b|x| \rightarrow x(a+b) \quad x \geq 0$$

$$\rightarrow x(a-b) \quad x < 0$$

$$\Rightarrow \begin{cases} a+b = \frac{1}{f} \\ a-b = \frac{1}{f} \end{cases} \rightarrow \begin{aligned} a &= \frac{f}{2} \\ b &= -\frac{1}{2f} \end{aligned}$$

$$ab = \frac{f}{2} \times -\frac{1}{2f} = -\frac{1}{4}$$

سوال ١٠

$$(2, -10) \xrightarrow{\text{نقطة}} \frac{f(2) + f}{2 + m} = -10 \rightarrow \frac{10}{2 + m} = -10 \quad \text{سوال ١٠}$$

$$m = -2 \rightarrow f \circ f^{-1}(m) = m \rightarrow m + \frac{f(m) + f}{m - 2} = \frac{2f - 2m + f(m) + f}{m - 2} = f$$

$$\Rightarrow f^{-1}(m) = \frac{f(m) + f}{m - 2} \quad \text{نقطة} \rightarrow \frac{2f - 2m + f(m) + f}{m - 2} = f \Rightarrow m = -\frac{f}{2}$$

$$\frac{a\beta + b}{c\delta + d} \text{ نكته}$$

$$f(2 - 2m) = 2 - g\left(\frac{m}{2}\right) \Rightarrow f \circ g^{-1}(f) + f^{-1}(-2) = ? \quad \text{سوال ١١}$$

$$\rightarrow -2 = 2 - (f) \Rightarrow \begin{cases} f(2 - 2m) = -2 \\ g\left(\frac{m}{2}\right) = f \end{cases} \xrightarrow{\text{نقطة}} f\left(\frac{m}{2}\right) + 2 - 2m = 2m + 2 - 2m = 2 \Rightarrow 2$$

$$y = m + f[m] \Rightarrow m = y + f[y] \quad f(m) = m + f[m] \quad \text{سوال ١٠}$$

$$[y] = [m + f[m]] \Rightarrow [y] = \delta[x] \Rightarrow [m] = \frac{[y]}{\delta}$$

$$\Rightarrow [y] = \frac{[m]}{\delta} \Rightarrow m - f[y] = y \Rightarrow m - \frac{f[m]}{\delta} = y$$

$$\Rightarrow g(m) = \frac{m - f[m]}{\delta} = y \Rightarrow (f \circ g)(m) = m + f[x] + \frac{f[m]}{\delta}$$

$$\Rightarrow \frac{f}{\delta} [x]$$