

الف) $n^2 - n = 2 \rightarrow n^2 - n - 2 = 0 \rightarrow \begin{cases} n = -1 \times \\ n = 2 \checkmark \end{cases}$
 $m = 3$

(٢) (١)

ب) $m = 2 \Rightarrow a = -1 \rightarrow n = 2$

$x = 1 \rightarrow y = 2 \Rightarrow R_f = [2, +\infty)$

(٢) (٢)

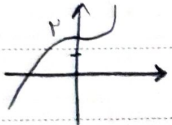
$x + a < 2 \xrightarrow{x < 1} a \leq 1$

$3x - 1 \xrightarrow{x \geq 1} 3x \geq 3 \rightarrow 3x - 1 \geq 2$

(٣) (٢)

$ax + a - 1 \rightarrow x \leq 0 \rightarrow ax \leq 1 - a \rightarrow ax + a - 1 \leq a - 1 \rightarrow a \leq 3$

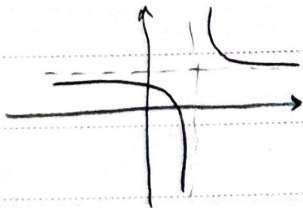
١) $a > 0 \rightarrow 0 < a < 3$

الف)  $y = x^3 + 2 \Rightarrow x = y^{\frac{1}{3}} + 2 \rightarrow y^{-1} = \sqrt[3]{x-2}$

(٣)

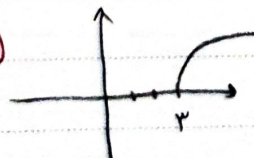
ب)  تابع يك به يك است

(٢)

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

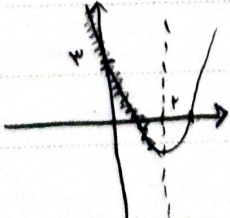
(٢)

ب) $y = \frac{2(x+1)}{x+2} \rightarrow y = 2 \Rightarrow \text{تابع يك به يك است}$

الف)  $y = \sqrt{x-3} \rightarrow x = y^2 + 3 \rightarrow x^2 = y - 3$
 $\hookrightarrow y^{-1} = x^2 + 3 \text{ و } x \geq 0$

(٢)

ب) $(x-1)(x-3)$ $x = 1$
 $x = 3$

 $y = x^2 - 4x + 3$
 $x = y^2 - 4y + 3$

١) $y^{-1} = \sqrt{x+1} + 2$

$\hookrightarrow x+1 = (y-2)^2 \Rightarrow$ ١

» به نام خدا »

$$y = x + \sqrt{x} \rightarrow x = y + \sqrt{y} \xrightarrow{+ \frac{1}{x}} x + \frac{1}{x} = (\sqrt{y} + \frac{1}{x})^2 - \sqrt{x + \frac{1}{x}} = \sqrt{y} + \frac{1}{x} \quad (✓)$$

$$(\sqrt{x + \frac{1}{x}} - \frac{1}{x})^2 = y \rightarrow y = x + \frac{1}{x} + \frac{1}{x} - \sqrt{x + \frac{1}{x}} \rightarrow \begin{matrix} a=1 \\ b=\frac{1}{x} \\ c=-\frac{1}{x} \end{matrix} \quad (✓)$$

$$a + 2b + c = 1 + 1 - 1 = 1$$

$$\left. \begin{aligned} \frac{x_1}{\sqrt{x_1^2 - 2}} &= y \\ \frac{x_2}{\sqrt{x_2^2 - 2}} &= y \end{aligned} \right\} \rightarrow \sqrt{x_1^2 - 2} = \sqrt{x_2^2 - 2} \Rightarrow x_1^2 = x_2^2 \rightarrow \text{تابع یک به یک} \rightarrow \text{رابطه یک به یک} \quad (✓)$$

$$x = \frac{y}{\sqrt{y^2 - 2}} \Rightarrow x^2 = \frac{y^2}{y^2 - 2} \Rightarrow y^2 = x^2 y^2 - 2x^2 \quad (✓)$$

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

$$x = \frac{y}{1 + |y|} \xrightarrow{y \geq 0} y = x + xy \Rightarrow y(x - 1) = -x \Rightarrow y = \frac{-x}{x - 1} \quad (✓) \quad (9)$$

$$\xrightarrow{y < 0} x - xy = y \Rightarrow y(x + 1) = x \Rightarrow y = \frac{x}{x + 1}$$

$$\hookrightarrow f\left(-\frac{x}{a}\right) = \frac{-\frac{x}{a}}{-\frac{x}{a} + 1} = \frac{-x}{-x + a}$$

$$\left. \begin{aligned} &+ \frac{-x}{-x + a} + \frac{x}{x + a} = \frac{-2x}{x^2 - a^2} \end{aligned} \right\}$$

$$y = \sqrt{x} - 1 \rightarrow x = \sqrt{y} - 1 \Rightarrow y^{-1} = (x + 1)^2 \Rightarrow g\left(-\frac{x}{a}\right) = \left(\frac{x}{a}\right)^2 = \frac{4}{x^2}$$

$$f(x) + \sqrt{f(x)} = 12 \xrightarrow{\sqrt{f(x)} = t} t^2 + t - 12 = 0 \rightarrow t = -4 \text{ و } t = 3$$

(1.)

$$\hookrightarrow f(x) = 9 \xrightarrow{f^{-1}(1)} f'(x) = \sqrt[3]{1} = 1 \quad (✓)$$