

1) $\{(2, 2), (n, 2), (2, n-1), (n, n-1), (-1, 1)\}$

2) $m=2 \quad n^2-n=2$

3) $n-n-2=0 \rightarrow (n-2)(n+1)=0 \rightarrow n=2 \checkmark \quad n=-1 \rightarrow \times$

4) $\{(-1, 1), (1, 2), (2, 3), (a, m-1), (a+2, 1), (m, 2)\}$

5) $m=2 \quad (-1, 1)(a, 1) \rightarrow a=-1$

6) $(a+2, 1) \rightarrow (1, 1) \quad (1, 2) \rightarrow h=2$

7) $f(n) = \begin{cases} 2n-1 & n \geq 1 \\ na & a < 1 \end{cases}$

$n+2 \leq r$
 $1+a \leq r$
 $a \leq 1$

(1, 2)

8) $f(n) = \begin{cases} 2n-1 & n \geq 1 \\ an+a-1 & n \leq 10 \end{cases}$

9) $an+a-1 < r \quad a-1 < r \quad a < r$

(5)

10) $a \neq 0 \quad 0 < a < r$

11) $a > 0 \quad a=1, 2$

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12) $f(n)$

13) $y \leq n^2 + 2$

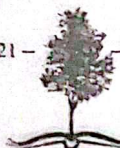
$y_1 \leq y_2$

$n_1^2 + 2 \leq n_2^2 + 2$

$n_1^2 = n_2^2 \Rightarrow n_1 = n_2 \checkmark$

14) $n = y^2 + 2 \rightarrow n-2 = y^2 \quad y = \sqrt{n-2}$

(5)



$$V) y = x + \sqrt{x}$$

$$x = y + \sqrt{y}$$

$$\text{دفعه } y + \sqrt{y} + \frac{1}{r} - \frac{1}{r} = 1$$

$$x + \frac{1}{r} = (\sqrt{y} + \frac{1}{r})^r$$

$$\sqrt{x + \frac{1}{r}} = \sqrt{y} + \frac{1}{r} \rightarrow \sqrt{y} = \sqrt{x + \frac{1}{r}} - \frac{1}{r}$$

$$y = x + \frac{1}{r} + \frac{1}{r} - \sqrt{x + \frac{1}{r}} = x - \sqrt{x + \frac{1}{r}} + \frac{1}{r}$$

$$a=1 \quad b=\frac{1}{r}$$

$$f^{-1}(x) = ax + b - \sqrt{x - c}$$

$$c = -\frac{1}{r}$$

$$a + rb + rc = 1 + 1 - 1 = 1$$

$$1) y = \frac{x}{\sqrt{x^r - r}}$$

$$\frac{x_1}{\sqrt{x_1^r - r}} = \frac{x_r}{\sqrt{x_r^r - r}}$$

$$x_1 (\sqrt{x_r^r - r}) = x_r \sqrt{x_1^r - r}$$

$$x_1^r \cancel{x_r^r} - r x_1 = x_r^r \cancel{x_1^r} - r x_r$$

$$-r x_1 = -r x_r \Rightarrow x_1 = x_r \quad \text{و نه}$$

$$x = \frac{y}{\sqrt{y^r - r}} \quad ()^r \quad x^r = \frac{y^r}{y^r - r}$$

$$x^r y^r - r x^r = y^r$$

$$r x^r = x^r y^r - y^r$$

$$y^r (x^r - 1) = r x^r$$

$$y^r = \frac{r x^r}{x^r - 1}$$

$$y = \sqrt[r]{\frac{r x^r}{x^r - 1}} = y = \frac{\sqrt[r]{r} x}{\sqrt{x^r - 1}}$$

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$$f^{-1}(x) = \frac{x}{x+|x|}$$

$$g(x) = \sqrt{x} - 1$$

$$x > 0$$

$$\frac{x}{1+x} = y \rightarrow \frac{y}{1+y} = x$$

$$y = x + yx$$

$$y - yx = x$$

$$y(1-x) = x$$

$$y = \frac{x}{1-x}$$

$$x < 0 \quad \frac{x}{1-x} = y \rightarrow$$

$$y = x - yx$$

$$y + yx = x \quad y(1+x) = x$$

$$y = \frac{x}{1+x}$$

$$g(x) = y = \sqrt{x} - 1$$

$$x = \sqrt{y} - 1$$

$$x+1 = \sqrt{y}$$

$$y = (x+1)^2$$

$$f(x) + g^{-1}(x) \quad x = -\frac{r}{a}$$

$$\frac{-\frac{r}{a}}{\frac{a-r}{a}} = -\frac{r}{a} + \left(-\frac{r}{a} + 1\right)^2$$

$$\frac{-\frac{r}{a}}{\frac{a-r}{a}} + \frac{1}{\frac{a-r}{a}} = \frac{r\sqrt{a-r}}{\sqrt{a-r}}$$

$$= -\frac{r\sqrt{a-r}}{\sqrt{a-r}}$$

$$10) f^{-1}(x) = \sqrt[n]{y-1}$$

$$g(x) = x^n + 1 + \sqrt[n]{x^n + 1}$$

$$\frac{x^n + 1}{x^n + 1} \cdot \frac{\sqrt[n]{x^n + 1}}{\sqrt[n]{x^n + 1}} = 1x$$

$$x^n + x^n - 1x = 0 \quad \begin{matrix} + = - \\ - = + \end{matrix}$$

$$\sqrt[n]{x^n + 1} = -x$$

$$\sqrt[n]{x^n + 1} = x$$

$$x^n + 1 = 1 \Rightarrow x = 1$$

$$g(1) \rightarrow g(x) = 1x$$

$$x = 1 \rightarrow 1 + 1 = 1x$$

$$g^{-1}(x) = 1x$$

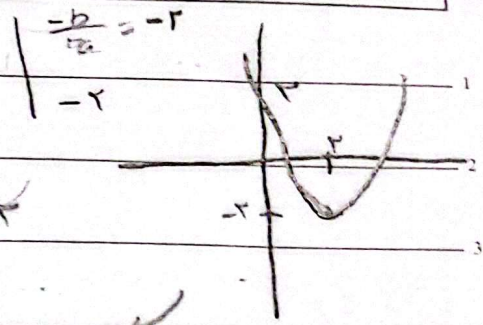
$$f) \quad y = x^2 - 2x + 2$$

$$y = (x-1)^2 - 1$$

$$(x_1-1)^2 - 1 = (x_2-1)^2 - 1$$

$$(x_1-1)^2 = (x_2-1)^2$$

$$x_1 = \pm x_2 \quad \text{نکته: } x_1 = x_2$$



g)

$$الف) \quad y = \frac{2x+1}{x-2} \rightarrow \text{نکته: } y = \frac{2x+1}{x-2}$$

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

1, 1/2

$$h) \quad y = \frac{2+2x}{x+2} = \frac{2x+2}{x+2} = 2$$

نکته: $y = 2$ خط افقی است.

z)

$$الف) \quad y = \sqrt{x-2}$$

$$\sqrt{x_1-2} = \sqrt{x_2-2}$$

$$x = \sqrt{y-2} \quad x_1 = \sqrt{y-2} \quad x_2 = \sqrt{y-2} \Rightarrow x_1 = x_2$$

$$x^2 + 2 = y$$

1/2

$$b) \quad y = x^2 - 2x + 2 \quad x \in [2, +\infty)$$

$$y = (x-1)^2 - 1$$

نکته: $y = -1$

$$x = (y+1)^{1/2} - 1$$

$$\sqrt{x+1} = y-2$$

$$y = \sqrt{x+1} + 2$$

