

الف)  $\{(3,2), (n,5), (3, n^2-n), (m,2), (-1, \xi)\}$

$n^2-n=2 \Rightarrow n^2-n-2=0 \Rightarrow (n-2)(n+1)=0$

$n=2$  ✓  
 $n=-1$  ❌

$m=3$   $n=2$

ب)  $\{(-1,1), (1,2), (2,3), (a, m-1), (a+2, n), (m, k), (a, 1)\}$

$m=2$   $n=2$   
 $a=-1$

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$f(x) = \begin{cases} kx-1 & x \geq 1 \\ x+a & x < 1 \end{cases}$

$1+a \leq 2$   
 $a < 1$

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$f(x) = \begin{cases} kx-1 & x \geq 1 \\ ax+a-1 & x < 1 \end{cases}$

$a > 0$

$a-1 < 2 \Rightarrow a < 3 \Rightarrow a < k$

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الف)  $y = x^k + 2$

$\Rightarrow x = y^{\frac{1}{k}} + 2 \Rightarrow x-2 = y^{\frac{1}{k}} \Rightarrow \sqrt[k]{x-2} = y$

ب)  $y = x^2 - 8x + 2$

$\frac{k}{2} = 2$

$17 - 8(1) = 9 = \frac{1}{3}$

تابع زوج است

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الف)  $y = \frac{kx+1}{n-2}$

$x = \frac{ky+1}{y-2} \Rightarrow xy - 2m = ky + 1$

$xy - ky = 2m + 1$

$y(n-2) = 2m + 1$

$y = \frac{2m+1}{n-2}$

ب)  $y = \frac{k+2m}{n+2} = \frac{2(k+m)}{n+2}$

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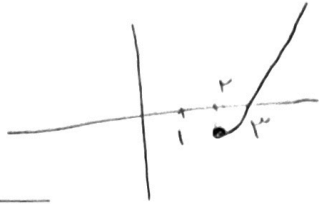
$$y = \sqrt{x-r}$$

$$x = \sqrt{y-r} \Rightarrow x^2 = y-r$$

$$f^{-1}(y)$$

$$y = x^2 + r$$

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



$$y = x^2 - \epsilon x + r + 1 - 1$$

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

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

$$f^{-1}(y) = r \pm \sqrt{y+1}$$

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

$$f(x) = x + \sqrt{x} + \frac{1}{x} - \frac{1}{x} \Rightarrow f(x) = \left(\sqrt{x} + \frac{1}{x}\right)^2 + \frac{1}{x}$$

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

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

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

$$y = \frac{x}{\sqrt{x^2-r}} \xrightarrow{\frac{x_1^2}{x_1^2-r}} \frac{x_1^2}{x_1^2-r} = \frac{x_1^2}{x_1^2-r} \Rightarrow \frac{x_1^2}{x_1^2-r} - \frac{x_1^2}{x_1^2-r} = \frac{x_1^2}{x_1^2-r} - \frac{x_1^2}{x_1^2-r}$$

$$x_1^2 = x_2^2 \Rightarrow x_1 = \pm x_2$$

یہ y کے لئے دو قدریں ہیں اور ان کے مابین ان کے مابین نسبت ہے

$$x^2 = \frac{y^2}{y^2-r} \Rightarrow x^2 y^2 - r y^2 = y^2 \Rightarrow x^2 y^2 = y^2 + r y^2 \Rightarrow \frac{x^2 y^2}{y^2 + r y^2} = y^2 \Rightarrow \frac{x^2}{x^2 + r} = y^2$$

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

$$\begin{cases} \text{if } y > 0 \rightarrow \frac{x}{1+x} = y \\ \text{if } y < 0 \rightarrow \frac{x}{1-x} = y \end{cases}$$

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

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

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

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

$$t + \sqrt{t-1} = 1 \Rightarrow (\sqrt{t+1} + 1)(\sqrt{t-1}) = 0$$

$$\sqrt{x^2+1} = r \Rightarrow x^2+1 = r^2 \Rightarrow x = \pm r$$