

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

$$x \geq 1$$

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

$$f(x) + g(x) = a + b\sqrt{x + c}$$

$$\left(\frac{a+b}{c}\right) = ? \quad z = \sqrt{x - F} \rightarrow x - F = z^2 \rightarrow x = z^2 + F$$

$$f(x) = \sqrt{z^2 + F + Fz} \rightarrow \sqrt{z^2 + Fz + F} \rightarrow f(x) = |z + F| \xrightarrow{z \geq F} f(x) = z + F$$

$$g(x) = \sqrt{z^2 + F - Fz} \rightarrow \sqrt{z^2 - Fz + F} \rightarrow f(x) = |z - F| \xrightarrow{z \geq F} g(x) = z - F$$

$$x \geq 1 \rightarrow x \geq 1 \rightarrow \sqrt{x - F} \geq \sqrt{F} = F \rightarrow z \geq F$$

$$f(x) + g(x) = z + F + z - F \rightarrow 2z \rightarrow 2\sqrt{x - F} \rightarrow a = 0, b = 2, c = -F$$

$$a = 0, b = 2, c = -F$$

$$\frac{a+b}{c} = \frac{0+2}{-F} = -\frac{2}{F}$$

$$f(x) = \frac{x + F}{x^2 - Fx + F} \quad / \quad g(x) = \{ (F, 1), (1, 0), (F, 0), (0, F) \} \rightarrow g(x) \neq 0$$

$$\frac{a}{F} = ? \quad (x - F, x - 1) \rightarrow F, 1 \rightarrow \text{مقادیر صحیح} \quad x = 0 \text{ یا } F \quad \text{از این دو مقادیر}$$

$$(I) x = 0 \rightarrow f(0) = \frac{F}{F} = 1, g(0) = F \rightarrow \frac{F}{1} = F$$

$$(II) x = F \rightarrow f(F) = \frac{F}{-1} = -F, g(F) = 1 \rightarrow -\frac{1}{F}$$

$$x \rightarrow \frac{a}{F} = \{ (0, F), (F, -\frac{1}{F}) \}$$

$$f(x) = \{ (0, F), (F, -1), (F, F), (-1, F) \}$$

$$g(x) = \{ (-F, F), (1, -1), (F, F), (-1, 0) \}$$

$$f(x) = \{ (0, F), (F, -1), (F, F), (-1, F) \}$$

$$x \in \{ 1, F, -1 \}$$

$$x \in \{ \frac{1}{F}, F, -\frac{1}{F} \}$$

$$f(x) = \{ (-F, F), (-1, F), (F, F), (F, F) \}$$

$$x \in \{ 1, F, -1 \}$$

$$x = 1 \rightarrow x = \pm 1$$

$$x = F \rightarrow x = \pm F$$

ج:  $\varphi_y^v(x) + 1$

$$\begin{aligned} x=0 &\rightarrow x=-1 \rightarrow \varphi(0^0)+1=1 \quad (-1, 1) \\ x=1 &\rightarrow \varphi(1^0)+1=2 \quad (1, 2) \\ x=2 &\rightarrow \varphi(2^0)+1=3 \quad (2, 3) \\ x=-1 &\rightarrow \varphi(0^5)+1=1 \quad (-1, 0) \end{aligned} \left\{ (-1, 1), (1, 2), (2, 3), (-1, 0) \right\}$$

د:  $\frac{p+q}{q}$   $\rightarrow \frac{p}{q} + 1 = \frac{p+q}{q}$   $\{ (1, 2), (2, 3), (-1, 0) \}$

$f(x) = \{ (1, 2), (2, 3), (-1, 0) \}$   $x = -1, 0, 1$

$g = \{ (0, 1), (1, 2), (-1, 0), (-2, -1), (2, 3) \}$

$h = f + g \rightarrow$

$h(-1) \rightarrow \varphi(0) + 1 = 1$

$h(1) \rightarrow \varphi(1) + 2 = 3$

$h(2) \rightarrow \varphi(2) + 3 = 4$

$h = \{ (-1, 1), (1, 3), (2, 4) \}$

$f(x) = \sqrt{\sqrt{x} - x}$   $g(x) = [x] + [-x]$

$x(x-x) \leftarrow \sqrt{x-x} \geq 0 \rightarrow x \geq 0$   $\leftarrow f(x) \geq 0$   $\text{I}$

$\rightarrow x(x-x) \geq 0 \rightarrow x \geq 0$   $\boxed{x \geq 0}$

$D_f = [0, 1] - \{1\}$

$g(x) = \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases}$

$g(x) = -1$

$-1 + 1 = 0$

$g(x) = 0$

$0 + 1 = 1$

$[1] + [-1] = 0 \leftarrow x=1$   
 $[1.5] + [-1.5] = -1 \leftarrow x=1.5$

$g(x) + 1 \neq 0$   $\rightarrow g(x) \neq -1$   $\text{II}$

$\leftarrow \text{III}$

$D = \{0, 1, 2\}$

$x \geq 0$

$x \neq 1$

$x \in \mathbb{Z}$

$\leftarrow f(x)$   $\text{III}$

$\leftarrow g(x)$

$f(x) = \sqrt{0 - x^2 - 1}$

$h(x) = \frac{f(x)}{g(x)} = ?$

$g(x) = \{ (1, 2), (2, 3), (-1, 0), (-2, -1) \}$

$$\omega x - x^p - k > 0 \rightarrow (x-1)(x-k) \geq 0 \rightarrow 1 \leq x \leq k \rightarrow D_f = [1, k]$$

$$x=1 \text{ (S)}, \rightarrow \sqrt{\omega-1-k} = 0 \rightarrow g(1) = \omega \rightarrow \frac{\omega}{\omega} = 0 \quad \text{از نقاط } g \text{ فقط } \omega, k, 1 \text{ را در نظر بگیریم}$$

$$x=k \text{ (S)}, \rightarrow \sqrt{\omega-k-k} = \sqrt{k} \rightarrow g(k) = k \rightarrow \frac{k}{k} = 1$$

$$x=k \text{ (S)}, \rightarrow \sqrt{\omega-1-k-k} = 0 \rightarrow g(k) = k \rightarrow \frac{k}{k} = 0$$

$$D_f \rightarrow \{ (1, \omega), (k, k), (k, 0) \}$$

$$\text{الف } y = x^{\omega} - kx^k + kx \rightarrow x^{\omega} - kx^k + kx - 1 + 1 \rightarrow y = (x-1)^{\omega} + 1$$

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$$y-1 = (x-1)^{\omega} \rightarrow \sqrt[\omega]{y-1} = x-1 \rightarrow \sqrt[\omega]{y-1} + 1 = x \xrightarrow{\omega} R_f = \mathbb{R}$$

$$\text{ب } y = \frac{1}{x^k - kx + 1} \rightarrow$$

$$\frac{1}{x^k - kx + 1} = y \rightarrow y(x^k - kx + 1) = 1$$

$$x^k - kx + 1 = \frac{1+y}{y}$$

$$x-1 = \frac{\sqrt{1+y}}{\sqrt{y}} \rightarrow x = \sqrt{\frac{1+y}{y}} + 1 \rightarrow 0, -1 \quad \frac{-1}{+} \frac{0}{-} \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$

$$\text{الف } y = x^k - kx + 1$$

$$k-1+1=0 \quad \min \left| \begin{matrix} p \\ c \end{matrix} \right| \rightarrow R_f = [c, +\infty)$$

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$$\text{ب } y = x^k + cx + k$$

$$-1+1+k = -1 \quad \max \left| \begin{matrix} p \\ c \end{matrix} \right| \rightarrow R_f = (-\infty, 1]$$

$$\text{ج } y = \sqrt{x^k - kx - k}$$

$$k-1-k \quad \min \left| \begin{matrix} p \\ -V \end{matrix} \right| \rightarrow R_f = \sqrt{[-V, +\infty)} \rightarrow [0, +\infty)$$

$$\text{د } y = \sqrt{4x - x^k}$$

$$1-k \quad \max \left| \begin{matrix} p \\ c \end{matrix} \right| \quad \sqrt{(-\infty, 4]} = [0, 2]$$

$$\text{الف } y = x^{\omega} - \omega x^k + kx + 1 \quad R_f = \mathbb{R} \quad \text{تابع متوجه می شود از جواب ها$$

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$$\text{ب } y = x^k - cx^k + kx + k \quad R_f = \mathbb{R}$$

$$\text{ج } y = \sqrt{x^k - cx^k + kx + 1} \rightarrow \sqrt{(-\infty, +\infty)} \rightarrow [0, +\infty)$$

$$\text{د } y = (x^{\omega} - kx^k + kx + 1)^{\frac{1}{\omega}}$$

$$(1-\infty, +\infty)^{\frac{1}{\omega}} \rightarrow [0, +\infty)$$

الف  $y = \frac{n+1}{n-4} \rightarrow \mathbb{R} - \{ \frac{4}{n} \} \rightarrow R_f = \mathbb{R} - \{ 4 \}$

ب  $y = \frac{2n+1}{n+1} \rightarrow \mathbb{R} - \{ \frac{2}{n} \} \rightarrow R_f = \mathbb{R} - \{ 2 \}$

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