

۲. آزمون عالی نوشتن



$$(\sqrt{x-4}\sqrt{x-4} + \sqrt{x+4}\sqrt{x-4})^2 = x-4 + x+4 + 2\sqrt{(x-4)^2} = 4x-12 = 4(x-3)$$

$\begin{matrix} x \geq 4 \\ \downarrow \\ 2x-12 \end{matrix}$

$$\sqrt{x-4} = a + b\sqrt{x+4}$$

$\begin{matrix} a & b \\ \downarrow & \downarrow \\ 0 & 1 \\ & -4 \end{matrix}$

$$\frac{2}{-4} = -\frac{1}{2}$$

✓

$$f(1) = -4$$

$$f(1) = 0$$

$$f(2) = 0$$

$$f(3) = \frac{2}{3}$$

$$\frac{g(0)}{f(0)} = 4$$

$$\frac{g(2)}{f(2)} = -\frac{1}{4}$$

$$\left. \begin{matrix} \frac{g(0)}{f(0)} = 4 \\ \frac{g(2)}{f(2)} = -\frac{1}{4} \end{matrix} \right\} \frac{g}{f} = \left\{ (2, -\frac{1}{4}), (0, 4) \right\}$$

الف)  $2x = 1 \Rightarrow x = \frac{1}{2} \Rightarrow f(2x) = \left\{ (\frac{1}{2}, 2), (\frac{5}{2}, -1), (2, 2), (-\frac{1}{2}, 2) \right\}$

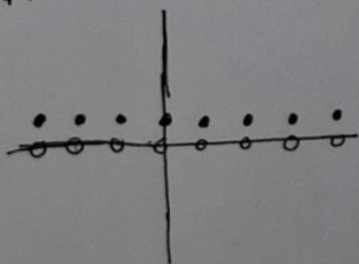
ب)  $x^2 = 1 \Rightarrow x = \pm 1 \Rightarrow f(x^2) = \left\{ (1, 2), (-1, 2), (\sqrt{5}, -1), (-\sqrt{5}, -1), (2, 2), (-2, 2) \right\}$

ج)  $2g^2(x) + 1 = 0 \Rightarrow x = -2 \Rightarrow g(x) = \sqrt{-2} \Rightarrow 2g^2(x) + 1 = \left\{ (-2, 1), (1, 2), (2, 1), (-1, 1) \right\}$

د)  $\frac{f(x)}{g} \Rightarrow \left\{ (1, -4), (2, -1) \right\}$

$$2f+g = \left\{ (2, 5), (3, 5), (-2, 2) \right\}$$

$$g(x) + 1 =$$



$$f(x) \rightarrow x \neq 2$$

$$f(x) \rightarrow x \geq 0$$

$$\sqrt{2x-x} \geq 0 \quad \sqrt{2x} \geq x \quad x \leq 2 \Rightarrow [0, 2] - \{2\}$$

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

$$\Delta n - n^2 - 4 \geq 0 \Rightarrow \underbrace{n^2 - 4n + 4}_{(n-2)(n-2)} \leq 0$$

$$Df \cap Dg = \{1, 2, 4\}$$

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

$$\{(1,0), (2, \frac{1}{2}), (4,0)\}$$

6

$$\text{الف) } g = n^2 - 2n^2 + 2n + 1 = 1 \Rightarrow g = (n-1)^2 + 1 \Rightarrow n = \sqrt{y-1} + 1 \Rightarrow R_g = \mathbb{R}$$

$$\text{ب) } yx^2 - y^2x - 1 = 0 \Rightarrow x = \frac{y \pm \sqrt{y^2 + 4y}}{2y} \Rightarrow 4y(y+1) \geq 0$$

$$\frac{-1}{2} \pm \frac{1}{2} = 0$$

$$(-\infty, -1] \cup (0, +\infty)$$

7

$$\text{الف) } \frac{x}{y} = 2 \Rightarrow x - 1 + 1 = 2 \Rightarrow R = [2, +\infty)$$

$$\text{ب) } \frac{-x}{y} = 2 \Rightarrow -9 + 18 + 3 = 12 \Rightarrow R = (-\infty, 12]$$

$$\text{ج) } x = 2 \Rightarrow \sqrt{x-1} = 1 \Rightarrow x = 2 \Rightarrow R = [2, +\infty)$$

$$\text{د) } x = 2 \Rightarrow y = 1 \Rightarrow R = [0, 2]$$

8

$$\text{الف) } \mathbb{R} \quad \text{ب) } \mathbb{R} \quad \text{ج) } [0, +\infty) \quad \text{د) } [0, +\infty)$$

9

$$\text{الف) } \frac{a}{c} = 3 \Rightarrow R = \mathbb{R} - \{3\}$$

$$\text{ب) } \frac{a}{c} = 2 \Rightarrow R = \mathbb{R} - \{2\}$$

10