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B. یازدهم

۱۹.۵

Name. خورگبای زاده کسوف

$$f(x) = \sqrt{x+4}\sqrt{x-4}$$

 $x > 4$

$$\rightarrow \sqrt{x+4}\sqrt{x-4} + \sqrt{x-4}\sqrt{x-4} = \quad (1 \text{ row})$$

$$g(x) = \sqrt{x-4}\sqrt{x-4}$$

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

$$-a + b\sqrt{x+c}$$

$$\rightarrow \sqrt{x-4} = t \rightarrow x-4 = t^2 \rightarrow x = t^2 + 4$$

$$\frac{a+b}{c} = ?$$

$$\rightarrow \sqrt{t^2+4+4t} + \sqrt{t^2+4-4t} = \sqrt{(t+2)^2} + \sqrt{(t-2)^2} = |t+2| + |t-2|$$

$$\rightarrow t = \sqrt{x-4} \geq \sqrt{1-4} = 2 \rightarrow t \geq 0 \rightarrow t+2 + t-2 = 2t = 2\sqrt{x-4}$$

$$\rightarrow a + b\sqrt{x+c} = 2\sqrt{x-4} \rightarrow a=0, b=2, c=-4$$

$$\frac{a+b}{c} = \frac{0+2}{-4} = -\frac{1}{2}$$

$$f(x) = \frac{x+2}{x^2-5x+3} \rightarrow \frac{x+2}{(x-3)(x-1)} \rightarrow x+2 \neq 0 \rightarrow x \neq -2$$

(2 row)

$$g(x) = \{(2,1), (1,0), (3,0), (0,4)\}$$

$$\frac{g}{f} = ? \rightarrow \frac{g(x)}{f(x)} = \frac{1}{\frac{x+2}{x^2-5x+3}} = -\frac{1}{f}, \quad \frac{g(0)}{f(0)} = \frac{4}{\frac{0+2}{0-0+3}} = \frac{4}{\frac{2}{3}} = 6$$

$$\rightarrow \frac{g}{f} = \{(2, -\frac{1}{f}), (0, 6)\}$$

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

سوال ۳

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

$$f(x) = \{(4, 2), (3, -1), (2, 2), (-4, 4)\} \rightarrow$$

باید تقسیم بدیم

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ب) $f(n^2) = \left\{ \begin{matrix} (1, 2) \\ (\sqrt{3}, 2) \\ (2, 2) \end{matrix} \right\} \leadsto \sqrt{-1} = \text{قوه نشسته}$
 $n^2=1 \rightarrow n=\pm 1$ $n^2=3 \rightarrow n=\pm\sqrt{3}$ $n^2=4 \rightarrow n=\pm 2$

ج) $2g^r(n)+1 = \left\{ (-2, 19), (1, 23), (3, 9), (-1, 1) \right\}$

د) $2 \frac{f}{g} = \left\{ (1, -4), (3, -1) \right\} \leadsto 1\% \leadsto \text{قوه نشسته}$

$f(n) = \left\{ (2, 1), (3, 1), (4, 9), (-2, 0) \right\}$

(سوال ۴)

$g(n) = \left\{ (0, 1), (2, 3), (-2, 4), (-1, 2), (3, 3) \right\}$

$h = f + g \rightarrow h = \left\{ (2, 0), (3, 0), (-2, 4) \right\}$

(سوال ۵)

$f(n) = \frac{\sqrt{3n} - n}{n - 2} \leadsto 3n \geq 0 \leadsto n \geq 0 \leadsto \sqrt{3n} - n \geq 0 \leadsto \sqrt{3n} \geq n$

$\rightarrow 3n \geq n^2 \rightarrow n^2 - 3n \leq 0 \rightarrow n(n - 3) \leq 0 \rightarrow 0 \leq n \leq 3$
 $\left. \begin{matrix} n - 2 \neq 0 \\ n \neq 2 \end{matrix} \right\} D_f = [0, 2) \cup (2, 3]$

$g(n) = [n] + [-n] \rightarrow D_g = \mathbb{R}$

$D_f = [0, 2) \cup (2, 3] \subset \mathbb{R}$

$\left(\frac{f}{g+1} \right)(n) = \frac{f(n)}{g(n)+1} \neq 0 \rightarrow n \in \mathbb{Z} \leadsto D = D_f \cap \mathbb{Z} = \{0, 1, 3\}$

(سوال ۶)

$L(n) = \sqrt{5n - n^2 - 4} \leadsto n^2 - 5n + 4 \leq 0 \rightarrow (n-1)(n-4) \leq 0 \rightarrow$

$1 \leq n \leq 4 \leadsto D_L = [1, 4]$

$g(n) = \left\{ (1, 3), (2, 2), (3, 4), (4, 1) \right\}$

$h(n) = \frac{L(n)}{g(n)} \leadsto \left\{ (1, 0), (2, \sqrt{2}), (4, 0) \right\}$



الف) $y = x^3 - 3x^2 + 3x \rightarrow y-1 = (x-1)^3 \rightarrow \sqrt[3]{y-1} = x-1 \rightarrow x = \sqrt[3]{y-1} + 1$ (سؤال ٧)

$\rightarrow R = (-\infty, +\infty) = \mathbb{R}$

ب) $y = \frac{1}{x^2 - 2x} \rightarrow y(x^2 - 2x) = 1 \rightarrow yx^2 - 2yx - 1 = 0 \rightarrow \Delta = 4y^2 + 4y = 4y(y+1)$
 $4y(y+1) \geq 0 \rightarrow y(y+1) \geq 0$

$\rightarrow y \leq -1 \text{ or } y \geq 0 \rightarrow 2y \pm \sqrt{\Delta} \leq 0 \rightarrow 2y \neq 0 \rightarrow y \neq 0 \rightarrow$

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

الف) $y = x^2 - 4x + 10 \rightarrow \text{ext} \left[\frac{4}{2} \right] (\text{min}) \rightarrow y \geq 6 \rightarrow R = [6, +\infty)$ (سؤال ٨)

ب) $y = -x^2 + 4x + 3 \rightarrow \text{ext} \left[\frac{4}{-2} \right] (\text{max}) \rightarrow y \leq 7 \rightarrow R = (-\infty, 7]$

ج) $y = \sqrt{x^2 - 6x - 4} \rightarrow \text{ext} \left[\frac{6}{2} \right] (\text{min}) \rightarrow y \geq -1 \rightarrow y \geq 0 \rightarrow R = [0, +\infty)$

د) $y = \sqrt{9x - x^2} \rightarrow \text{ext} \left[\frac{9}{2} \right] (\text{max}) \rightarrow y \leq 3 \rightarrow 0 \leq y \leq 3 \rightarrow R = [0, 3]$

الف) $y = x^3 - 6x^2 + 9x + 1 \rightarrow R = (-\infty, +\infty) = \mathbb{R}$ (سؤال ٩)

ب) $y = x^3 - 4x^2 + 3x + 2 \rightarrow R = (-\infty, +\infty) = \mathbb{R}$

ج) $y = \sqrt{x^2 - 4x + 5} \rightarrow \sqrt{(-\infty, +\infty)} \rightarrow R = [0, +\infty)$

د) $y = (x^2 - 6x^2 + 9x + 1)^2 \rightarrow ((-\infty, +\infty))^2 \rightarrow R = [0, +\infty)$

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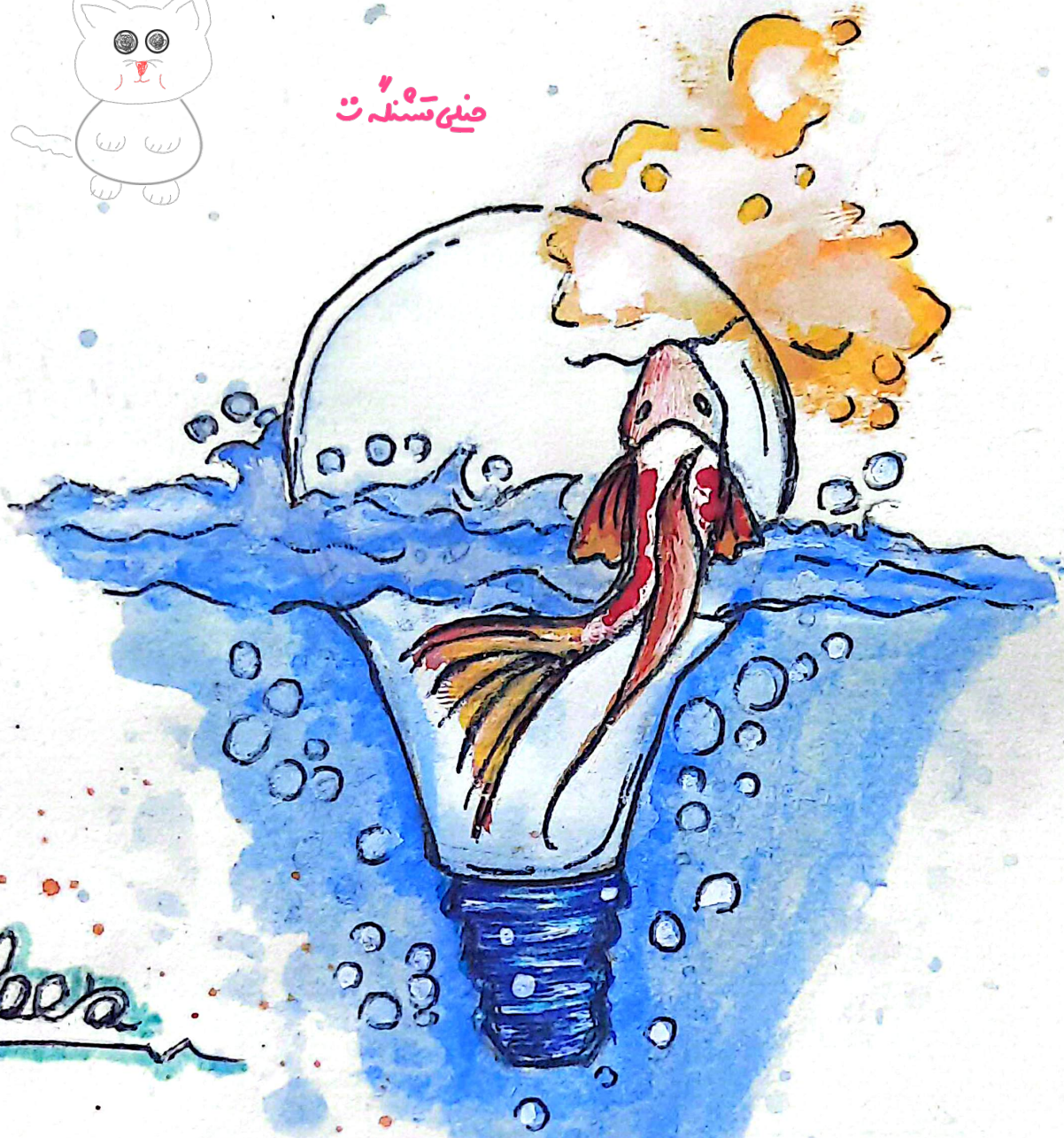
$$\text{a)} \quad y = \frac{r(n+1)}{n-r} \longrightarrow R = R - \{r\}$$

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$$\text{b)} \quad y = \frac{r(n+1)}{n+1} \longrightarrow R = R - \{r\}$$



فنی سنہ ت



(۳) x های f باید حقیق برابر نباشند!

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

هرگاه x های f را برابر x^2 قرار دهیم!

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

این عمل روی y های g اعمال می‌شود:

$$g^{-1}(x) + 1 = \left\{ (-2, 19) (1, 3) (3, 9) (-1, 1) \right\}$$

$$\frac{2f}{g} = \left\{ \left(1, \frac{2 \times 2}{-1} \right) \left(3, \frac{2 \times -1}{2} \right) \text{ و } \left(-1, \frac{2 \times 4}{2} \right) \right\} = \left\{ (1, -4) (3, -1) \right\}$$