

سوال ۱ تا ۷ ارسال شده است و نام و نام خانوادگی نوشته شده است! صبر

الف) $\frac{-b}{2a} = 2 \rightarrow x = 2 \rightarrow 4 - 8 + 1 = -3$ $R_f = [-3, +\infty)$

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ب) $\frac{-b}{2a} = 2 \rightarrow -9 + 18 + 4 = 13$ $R_f = (-\infty, 13]$

ج) $\frac{-b}{2a} = 2 \rightarrow 1 - 4 - 1 - 2 = -7$ $R_f = (-\infty, -7)$

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د) $\frac{-b}{2a} = 2 \rightarrow 18 - 9 = 9$ $R_f = (-\infty, 9]$

ه) $R_f = R$ $\frac{-b}{2a} = 2 \rightarrow 18 - 9 = 9$ $R_f = (-\infty, 9]$

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$$f(x) = \sqrt{x-4 + 4\sqrt{x-4}} + 4 = \sqrt{(\sqrt{x-4} + 2)^2} = |\sqrt{x-4} + 2| = \sqrt{x-4} + 2 \quad (1)$$

$$g(x) = \sqrt{x-4 - 4\sqrt{x-4}} + 4 = \sqrt{(\sqrt{x-4} - 2)^2} = |\sqrt{x-4} - 2| \xrightarrow{x \geq 4} \sqrt{x-4} - 2$$

$$f(x) + g(x) = \sqrt{x-4} + 2 + \sqrt{x-4} - 2 = 2\sqrt{x-4} \quad \begin{matrix} \rightarrow a=0 \\ \rightarrow b=2 \\ \rightarrow c=-4 \end{matrix} \rightarrow \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2}$$

$$Df = \mathbb{R} - \{1, 3\} \quad (x^2 - 4x + 3 \neq 0 \rightarrow x \neq 1, 3) \quad (2)$$

$$Df \cap Dg = \{2, 0\} \rightarrow \frac{g}{f} = \left\{ \left(2, -\frac{1}{2}\right), \left(0, 4\right) \right\}$$

$$f(x) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), (2, 2), \left(-\frac{1}{2}, 4\right) \right\} \quad x \text{ های } f \text{ باید متمم یکدیگر باشند!} \quad (3)$$

$$f(x^2) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\} \quad \text{همه آنها؛ } x \text{ های } f \text{ را برابر } x^2 \text{ قرار دهیم!}$$

$$2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\} \quad \text{این عمل روی } y \text{ های و اعمال می شود:}$$

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

$$Dh = Df \cap Dg \rightarrow Dh = \{2, -2, 3\} \quad (4)$$

$$h(x) = 2f(x) + g(x) \rightarrow h = \left\{ (2, 5), (-2, 4), (3, 5) \right\}$$

$$f(n) = \frac{\sqrt{3n} - n}{n-2} \rightarrow \begin{cases} n \neq 2 \\ n \geq 0 \end{cases} (\sqrt{3n}) \rightarrow D_f = [0, 2] - \{2\} \quad (5)$$

$$\sqrt{3n} - n \geq 0 \rightarrow 3n \geq n^2 \rightarrow 0 \leq n \leq 3$$

$$g(n) + 1 \neq 0 \rightarrow g(n) \neq -1 \rightarrow [n] + [-n] \neq -1 \rightarrow n \in \mathbb{Z}$$

$$D_{\frac{f}{g+1}} = \left\{ D_f \cap D_g, g(n) \neq -1 \right\} = \left\{ 0, 1, 3 \right\}$$

$$[0, 3] - \{2\} \cap \mathbb{Z}$$

$$D_f \rightarrow \sqrt{3n} - n^2 - 2 \geq 0 \rightarrow n^2 - \sqrt{3n} + 2 \leq 0 \rightarrow 1 \leq n \leq 4 \quad (9)$$

$$D_f \cap D_g = \{1, 2, 3\}$$

$$\frac{f}{g} = h = \left\{ (1, 0), (2, \sqrt{\frac{2}{3}}), (3, 0) \right\}$$

$$\text{الف) } y = n^3 - 3n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1 \quad (10)$$

$$y-1 = (n-1)^3 \rightarrow \sqrt[3]{y-1} = n-1 \rightarrow n = \sqrt[3]{y-1} + 1$$

$$R_f = \mathbb{R}$$

$$\text{ب) } y = \frac{1}{n^2 - 2n} \rightarrow n^2 y - 2n y = 1 \rightarrow n^2 y - 2n y - 1 = 0$$

$$y \neq 0 \rightarrow n = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow 4y(y+1) \geq 0 \rightarrow \frac{-1}{1} \leq \frac{0}{1}$$

$$y = 0 \rightarrow 0 = 1 \times \text{صفتين وجهد ندارد!} \rightarrow R_f = (-\infty, -1] \cup [0, +\infty)$$