

[illegible]

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

2.1
2.2

$$\frac{g}{f} = (10, 4) \left(\frac{1}{2}, \frac{1}{2} \right)$$

b) $f(x) = \{(1, y), (11, y)\}$ $f(x) = \{(x, y)\}$ $x^r = 1 \leq r \leq K$

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

2, 1, 2

$D_g = \mathbb{R}$ $\{ \text{و } 0 \}$ n باید عضو باشد مگر صفر صفر است!

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CamScanner

$$D_f = \omega n - n^r - \varepsilon \geq 0 \Rightarrow n^r - \omega n + \varepsilon \leq 0 \Leftrightarrow (n-1)(n-\varepsilon) \leq 0$$

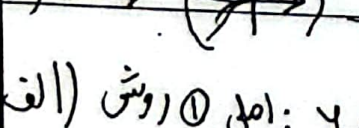
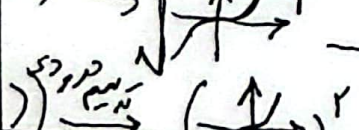
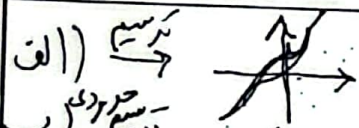
$$\frac{1}{1-\varepsilon} \quad D_f = [1, \varepsilon] \quad D_f \cup D_g = \{1, \varepsilon\}$$

$$h(n) = \frac{f(n)}{g(n)} = \left\{ (1, 0), \left(\varepsilon, \frac{\varepsilon}{1-\varepsilon} \right), (\varepsilon, 0) \right\}$$

الف) $y = n^r - 2n^r + 2 - 1 + 1 \Rightarrow y = (n-1)^2 + 1 \Rightarrow y-1 = (n-1)^2 \Rightarrow \sqrt{y-1} = n-1$
 $n = \sqrt{y-1} + 1 \Rightarrow R_f = [1, \infty)$

ب) $y = n^r - 2n^r = 1 \Rightarrow n^r - 2n^r = \frac{1}{y} \Rightarrow n - 2n + 1 = \frac{1+y}{y} \Rightarrow (n-1)^2 = \frac{1+y}{y} \Rightarrow \sqrt{\frac{1+y}{y}} = n-1$
 $\frac{1+y}{y} + 1 = n \Rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$

ج) $y = n^r - \varepsilon n + 10 \Rightarrow \frac{-b}{2a} = 2 \Rightarrow y = \varepsilon - 10 + 10 \Rightarrow y_{\min} = 0 \Rightarrow R_f = [0, +\infty)$
 د) $y = -n^r + 2n + 3 \Rightarrow \frac{-b}{2a} = 1 \Rightarrow y = -9 + 10 + 3 \Rightarrow y_{\max} = 4 \Rightarrow R_f = (-\infty, 4]$
 هـ) $y = \sqrt{n^r - \varepsilon n - 3} \Rightarrow \frac{-b}{2a} = 2 \Rightarrow y = \varepsilon - 10 - 3 = -13 \Rightarrow y_{\min} = -13 \Rightarrow R_f = [-13, +\infty)$
 و) $y = \sqrt{4n - n^r} \Rightarrow \frac{-b}{2a} = 2 \Rightarrow y = \sqrt{10 - 9} \Rightarrow y = 1 \Rightarrow R_f = [0, 1]$



چون توان منفر دار

چون بزرگترین مقدار دارد

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مقدار مثبت

$$R_f = \mathbb{R}$$

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الف) روش اول: $y = n + y = 2n + 1 \Rightarrow y = n - 2n = y + 1 \Rightarrow n(y-2) = y+1 \Rightarrow n = \frac{y+1}{y-2}$
 $R_f \neq 2 \Rightarrow R_f = \mathbb{R} - \{2\}$

ب) روش اول: $y = n + y = 2n + 1 \Rightarrow y = n - 2n = y + 1 \Rightarrow n(y-2) = -y+1 \Rightarrow n = \frac{-y+1}{y-2}$
 $R_f \neq 2 \Rightarrow R_f = \mathbb{R} - \{2\}$

$$n = \frac{-y+1}{y-2} \Rightarrow y \neq 2 \Rightarrow R_f = \mathbb{R} - \{2\}$$

$$\text{روش دوم: } \mathbb{R} - \{2\} = \mathbb{R} - \{2\}$$

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

$$g(n) = \sqrt{x-4-4\sqrt{n-4}+4} = \sqrt{(\sqrt{n-4}-2)^2} = |\sqrt{n-4}-2| \xrightarrow{n \geq 8} \sqrt{n-4}-2$$

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

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

$$f(n) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\} \quad \text{هرکدام از } n \text{ های } f \text{ را برابر } n^2 \text{ قرار دهیم!}$$

$$2g'(n)+1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\} \quad \text{این عمل روی } n \text{ های } g \text{ اعمال می شود!}$$

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

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

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

$$f(n) = \frac{\sqrt{3n}-n}{n-2} \rightarrow \begin{cases} n \neq 2 \\ n \geq 0 \end{cases} (\sqrt{3n}) \rightarrow Df = [0, \infty) - \{2\} \quad (4)$$

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

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

$$D \frac{f}{g+1} = \left\{ Df \cap Dg, g(n) \neq -1 \right\} = \left\{ 0, 1, 3 \right\}$$

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

$$\text{الف - ٨) } y = x^2 - 2x + 1 \rightarrow \min \left| \begin{array}{l} x = \frac{f}{2} = 1 \\ y = 1 - 2 + 1 = 0 \end{array} \right. \rightarrow R_f = [0, +\infty)$$

$$\text{ب - ٨) } y = -x^2 + 4x + 3 \rightarrow \max \left| \begin{array}{l} x = \frac{-4}{-2} = 2 \\ y = -9 + 18 + 3 = 12 \end{array} \right. \rightarrow R_f = (-\infty, 12]$$

$$\text{ج - ٨) } y = x^2 - 2x - 3 \rightarrow \min \left| \begin{array}{l} x = \frac{f}{2} = 1 \\ y = 1 - 2 - 3 = -4 \end{array} \right. \rightarrow R_f = \sqrt{[-4, +\infty)} = [-4, +\infty)$$

$$\text{د - ٨) } y = 4x - x^2 \rightarrow \max \left| \begin{array}{l} x = \frac{-4}{-2} = 2 \\ y = 18 - 9 = 9 \end{array} \right. \rightarrow R_f = \sqrt{(-\infty, 9]} = (-\infty, 9]$$