

$$(f(n) + g(n))^2 = f^2 + g^2 + 2fg \rightarrow f^2 = n + 4\sqrt{n-4} / g^2 = n - 4\sqrt{n-4}$$

$$f^2 + g^2 = 2n$$

$$f \times g = \sqrt{(n+4\sqrt{n-4})(n-4\sqrt{n-4})} = \sqrt{n^2 - 16n + 16} = \sqrt{(n-4)^2}, n \geq 4$$

$$(f+g)^2 = 2n + 2(n-4) = 4(n-2) \rightarrow f+g = 2\sqrt{n-2} = a+b\sqrt{n+c}$$

$$a+b = 2, a-b = -4 \rightarrow \begin{cases} a=0 \\ b=2 \\ c=-4 \end{cases}$$

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

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

$$f(1) = \frac{3}{0} \rightarrow \text{تعریف نشود} \times \quad f(0) = \frac{2}{4} \rightarrow \frac{g(0)}{f(0)} = 4 \times \frac{3}{4} = 3$$

$$f(3) = \frac{5}{0} \rightarrow \text{تعریف نشود} \times \quad g(0) = 4$$

$$n \in \{1, 2, 3, -1\} \rightarrow n \in \{\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, -\frac{1}{2}\} \rightarrow f(n) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), \left(\frac{5}{2}, 2\right), \left(-\frac{1}{2}, 2\right) \right\}$$

$$n^2 \in \{1, 3, 4, \dots\} \rightarrow n^2 = 1 \rightarrow n = \pm 1$$

$$n^2 = 3 \rightarrow n = \pm\sqrt{3}$$

$$n^2 = 4 \rightarrow n = \pm 2$$

$$g(-2) = 3 \rightarrow 2(2)^2 + 1 = 19$$

$$g(1) = -1 \rightarrow 2(-1)^2 + 1 = 3$$

$$g(4) = 2 \rightarrow 2(2)^2 + 1 = 9$$

$$g(-1) = 0 \rightarrow 2(0)^2 + 1 = 1$$

$$g(n) \neq 0 \rightarrow \frac{f(n)}{g(n)} = \left\{ \frac{2}{-1}, \frac{3}{2}, \frac{5}{2}, -\frac{1}{2} \right\}$$

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

$$f(3) = 5, g(3) = 2 \rightarrow \frac{f}{g} = \frac{5}{2}, f(-1) = 2, g(-1) = 0 \rightarrow \text{تعریف نشود}$$

$$h = \{(2, 5), (3, 5), (-2, 4)\}$$

$$n = 2 \rightarrow h = 5, n = 3 \rightarrow h = 5, n = -2 \rightarrow h = 4$$

$$D_f = n \geq 0, \sqrt{4n} - n \geq 0, n \neq 2 \rightarrow D_f = [0, 3] - \{2\}$$

$$g(n) = \begin{cases} 0 & n \in \mathbb{Z} \\ -1 & n \notin \mathbb{Z} \end{cases} \rightarrow \text{جواب سوال 4: دایره مشترک: } \{2, 3, -2\}$$

$$D_{f \cap g} = \{0, 1, 2, 3\}$$

$$\text{شماره منفرجه} = 0 \rightarrow \text{این حالت محال است}$$

$n \geq 1$ و $n=6$ رسانی $f(n)$ هست!

$$n=1 \rightarrow f(1)=1, g(1)=2 \rightarrow h(1)=1/2$$

$$n=2 \rightarrow f(2)=2, g(2)=2 \rightarrow h(2)=1$$

$$n=3 \rightarrow f(3)=2, g(3)=4 \rightarrow h(3)=1/2$$

$$n=4 \rightarrow f(4)=1, g(4)=1 \rightarrow h(4)=1$$

$$h = \left\{ \begin{array}{l} (1, 1/2) \\ (2, 1) \\ (3, 1/2) \\ (4, 1) \end{array} \right\}$$

داده

دامنه f باید مطابق دامنه g اشتراک گرفته شود!

$$y = n(n-1)(n-2)$$

$$n \rightarrow +\infty \Rightarrow y \rightarrow +\infty$$

$$n \rightarrow -\infty \Rightarrow y \rightarrow -\infty$$

$$R_f = \mathbb{R}$$

باید بردار دوش اصلی پیدا شود!

$$y(n^2-2n)=1 \rightarrow n^2-2n=1/y \rightarrow (n-1)^2=1/y+1$$

$$n-1=\sqrt{1/y+1} \rightarrow 1/y+1 \geq 0 \rightarrow y+1 \geq 0 \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$

$$f' = -\frac{b}{2a} = -\frac{4}{2} = -2 \rightarrow n=2 \rightarrow y = -9 + 18 + 3 = 12 \rightarrow R_f = [12, +\infty)$$

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$$f' = -\frac{b}{2a} = 2, y = -7 \rightarrow \sqrt{[-7, +\infty)} \Rightarrow R_f = [0, +\infty)$$

$$f' = 4, y = 9 \rightarrow \sqrt{[-\infty, 9]} \Rightarrow [0, 3] = R_f$$

$$R_f = \mathbb{R}$$

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الف) بزرگترین توان n فرد است

ب) "

$$\sqrt{[-\infty, +\infty)} \Rightarrow R_f = [0, +\infty)$$

$$[[-\infty, +\infty)]^2 \Rightarrow R_f = [0, +\infty)$$

$$a=3, c=1 \rightarrow R_f = \mathbb{R} - \{3/1\} \Rightarrow \mathbb{R} - \{3\}$$

$$a=2, c=1 \rightarrow R_f = \mathbb{R} - \{2/1\} \Rightarrow \mathbb{R} - \{2\}$$

نمودار 3131

$$Df \rightarrow \omega_n - n^r - \varepsilon \geq \cdot \rightarrow n^r - \omega_n + \varepsilon \leq \cdot \rightarrow 1 \leq n \leq \varepsilon$$

(4)

$$Df \cap Dg = \{1, 2, 3\}$$

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

(الف) $y = n^3 - 2n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1$

(5)

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

$$R_f = \mathbb{R}$$

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

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

$y = 0 \rightarrow 0 = 1 \times$ صفتی وجود ندارد! $\rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$