

پیرا یعنی
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$$f(n) = \left(\frac{1}{r}\right)^{n-2} - 1$$

$$f(n+1) = \left(\frac{1}{r}\right)^{n+1-2} - 1 = \left(\frac{1}{r}\right)^{n-1} - 1$$

$$\underbrace{n^3}_{\text{تغییر علامت}} \underbrace{\left(\frac{1}{r}\right)^{n-1} - 1}_{\text{تغییر علامت}} \geq 0$$

$$n^3 \begin{cases} n > 0 \rightarrow n^3 > 0 \\ n = 0 \rightarrow n^3 = 0 \\ n < 0 \rightarrow n^3 < 0 \end{cases}$$

$$\left(\frac{1}{r}\right)^{n-1} - 1 \geq 0 \rightarrow \left(\frac{1}{r}\right)^{n-1} \geq 1$$

$$\left(\frac{1}{r}\right)^{n-1} \geq \left(\frac{1}{r}\right)^0 \rightarrow n-1 \leq 0 \rightarrow n \leq 1$$

$$n^3 < 0 \text{ و } \left(\frac{1}{r}\right)^{n-1} - 1 > 0 \rightarrow \text{عبارت منفی}$$

$$n^3 > 0 \text{ و } \left(\frac{1}{r}\right)^{n-1} - 1 < 0 \rightarrow \text{عبارت منفی}$$

یا باید عدد و مثبت باشند یا عدد و منفی یا یکی صفر.

$$\left. \begin{aligned} n > 1 \rightarrow \left(\frac{1}{r}\right)^{n-1} - 1 < 0 \\ n < 0 \rightarrow n^3 < 0 \end{aligned} \right\} \text{اشتراک نمی}$$

$$n > 0 \rightarrow n^3 > 0$$

$$n \leq 1 \rightarrow \left(\frac{1}{r}\right)^{n-1} - 1 \geq 0 \xrightarrow{\text{اشتراک}} [0, 1]$$

$$n^3 = 0 \rightarrow n = 0$$

$$\left(\frac{1}{r}\right)^{n-1} - 1 \geq 0 \rightarrow \left(\frac{1}{r}\right)^{n-1} = 1 \rightarrow \left(\frac{1}{r}\right)^0 = 1 \rightarrow n-1 = 0 \rightarrow n = 1$$

Arman

اشتراک همدی جواب ها بازه $[0, 1]$ است.

پیرا ایسی

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$$f(x) = \sqrt{x+|x+2|} \rightarrow f(-x) = \sqrt{-x+1-x+2}$$

$$-x+1-x+2 \geq 0$$

$$\text{اگر } -x+2 \geq 0 \rightarrow -x-x+2 \geq 0 \rightarrow -2x+2 \geq 0 \rightarrow$$

$$2 \geq 2x \rightarrow 1 \geq x \leq 1 \text{ (شرط اول)} \quad x \leq 1$$

$$\text{اگر } -x+2 < 0 \rightarrow -x+x-2 \geq 0 \rightarrow -2 \geq 0 \quad \text{امکان ندارد}$$

$$D_f = (-\infty, 1]$$

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$$y = \sqrt{\frac{x-1}{f(x)}}$$

$$\text{اگر } f(x) = 0 \rightarrow x = 3 \leq x = 2 \leq x = -\varepsilon \quad \begin{cases} x < -\varepsilon \rightarrow f(x) > 0 \\ x > 3 \rightarrow f(x) < 0 \\ -\varepsilon < x < 2 \rightarrow f(x) < 0 \\ 2 < x < 3 \rightarrow f(x) > 0 \end{cases}$$

$$f(x) \neq 0, \quad \frac{x-1}{f(x)} \geq 0$$

$$f(x) > 0 \rightarrow x-1 > 0 \rightarrow x > 1$$

$$f(x) < 0 \rightarrow x-1 < 0 \rightarrow x < 1$$

$$x < -\varepsilon, x > 1 \rightarrow X$$

$$x > 3, x < 1 \rightarrow X$$

$$-\varepsilon < x < 2, x < 1 \rightarrow -\varepsilon < x < 1$$

$$2 < x < 3, x > 1 \rightarrow 2 < x < 3$$

$$\frac{x-1}{f(x)} = 0 \rightarrow x-1 = 0 \rightarrow x = 1$$

$$f(x) \neq 0$$

$$\text{پس } D = [-\varepsilon, 1) \cup (2, 3)$$

پیرا امینی

$$\sqrt{-(a+b)} = ?$$

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$$y_1 = \frac{1}{9n^2 - 5n^2 - 2n - 3}$$

$$9n^2 - 5n^2 - 2n - 3$$

$$\hookrightarrow (3n^2 + an + b)(3n^2 + cn + d)$$

$$\hookrightarrow 9n^4 + (3c + 3a)n^3 + (ac + 3b + 3d)n^2 + (ad + bc)n + bd$$

$$3c + 3a = 0 \rightarrow a = -c$$

$$bd = -3$$

$$a = 1, b = 1 \rightarrow a + b = 2 \rightarrow \sqrt{-2} \text{ تعریف نشده}$$

$$f(n) = n^3 + n \quad \sqrt{f(n) - f\left(\frac{1}{n}\right)}$$

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$$\sqrt{n^3 + n - \frac{4\varepsilon}{n^2} - \frac{\varepsilon}{n}}$$

$$\hookrightarrow \frac{n^4 + n^2\varepsilon - \varepsilon n^2 - 4\varepsilon}{n^2}$$

$$\frac{n^4 + n^2\varepsilon - \varepsilon n^2 - 4\varepsilon}{n^2} \geq 0$$

$$n^4 + n^2\varepsilon - \varepsilon n^2 - 4\varepsilon \xrightarrow{n^2=t} t^2 + t^2\varepsilon - \varepsilon t - 4\varepsilon = 0$$

$$\begin{array}{r|l} \text{مثلاً } t = \varepsilon & \rightarrow \begin{array}{r} t^2 + t^2\varepsilon - \varepsilon t - 4\varepsilon \\ - t^2 + \varepsilon t^2 \\ \hline \varepsilon t^2 - \varepsilon t - 4\varepsilon \\ - \varepsilon t^2 + 2\varepsilon t \\ \hline 14t - 4\varepsilon \\ - 14t + 4\varepsilon \\ \hline 0 \end{array} \end{array}$$

پہلی ایسٹری

ک-ادامہ

$$(t-4)(t^2+5t+14)=0$$

ہمارے مثبت

$$t=4$$

$$t^2+5t+14=0 \rightarrow \Delta < 0$$

$$t^2+t^2-4t-44 \rightarrow \text{یک ریشہ دارد}$$

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

$$n^3 \neq 0 \rightarrow n \neq 0 \quad \text{خارج}$$

$$\checkmark \rightarrow t > 4 \rightarrow \text{صورت} > 0$$

$$\checkmark \rightarrow t < 4 \rightarrow \text{صورت} < 0$$

$$n^2 > 4 \rightarrow n > 2 \text{ یا } n < -2$$

$$n^2 < 4 \rightarrow -2 < n < 2$$

$$\checkmark \quad n > 0 \rightarrow \text{صورت} > 0$$

$$\checkmark \quad n < 0 \rightarrow \text{صورت} < 0$$

$$(n > 2 \text{ یا } n < -2) \cap (n > 0) \rightarrow n > 2$$

$$(n < 0) \cap (-2 < n < 2) \rightarrow n \in [-2, 0]$$

$$2 \text{ فیروزه است, } n \neq 0 \rightarrow \text{شرطها}$$

$$[-2, 0) \cup [2, +\infty) \rightarrow \text{دامنه}$$

$$f(n^3+n) = 2n^2-1$$

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$$f(2) \rightarrow n^3+n=2 \rightarrow n=1 \rightarrow f(2)=1$$

$$f(10) \rightarrow n^3+n=10 \rightarrow n=2 \rightarrow f(10)=7$$

$$1+7=8$$

پیرا اسی

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$$g(x) = x^3 + 9x^2 + 12x$$

$$f(x) = x^3 - 4x^2 + 12x$$

$$g(\sqrt{5} - 3)$$

$$f(\sqrt{5} + 2)$$

$$(a+b)^3 = a^3 + a^2b + ab^2 + b^3$$

$$(x+b)^3 = x^3 + 3x^2b + 3xb^2 + b^3$$

$$3b = 9 \rightarrow b = 3$$

$$3b^2 = 12 \rightarrow b^2 = 4 \rightarrow b = \pm 2 \rightarrow b = 2$$

$$g(A) = (A+3)^3 - 12$$

$$g(\sqrt{5} - 3) = ((\sqrt{5}) - 3 + 3)^3 - 12 = 5 - 12 = -7$$

$$(a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$(x-b)^3 = x^3 - 3x^2b + 3xb^2 - b^3$$

$$-4 = -3b \rightarrow b = \frac{4}{3}$$

$$3b^2 = 12 \rightarrow b^2 = 4 \rightarrow b = \pm 2 \rightarrow b = 2$$

$$f(A) = (A-2)^3 + 8$$

$$f(\sqrt{5} + 2) = ((\sqrt{5} + 2) - 2)^3 + 8 = 5 + 8 = 13$$

$$g(\sqrt{5} - 3)$$

$$\frac{g(\sqrt{5} - 3)}{f(\sqrt{5} + 2)} = \frac{-7}{13} = -\frac{7}{13}$$

پیرا احسن
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$$\left. \begin{aligned} f(n) &= \sqrt{n + \varepsilon \sqrt{n - \varepsilon}} \\ g(n) &= \sqrt{n - \varepsilon \sqrt{n - \varepsilon}} \end{aligned} \right\} n \geq \varepsilon$$

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

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

$$\varepsilon \sqrt{n - \varepsilon} = 2 \times 2 \sqrt{n - \varepsilon} = 2 \sqrt{\varepsilon(n - \varepsilon)} = 2 \sqrt{\varepsilon n - 14}$$

$$f(n) = \sqrt{n + 2\sqrt{\varepsilon n - 14}}$$

$$g(n) = \sqrt{n - 2\sqrt{\varepsilon n - 14}}$$

$$(n - \varepsilon) + \varepsilon = n$$

$$(n - \varepsilon) \times \varepsilon = \varepsilon n - 14$$

$$\left. \begin{aligned} f(n) &= \sqrt{(\sqrt{n - \varepsilon} + \sqrt{\varepsilon})^2} = \sqrt{n - \varepsilon} + \sqrt{\varepsilon} \\ &= \sqrt{n - \varepsilon} + 2 \end{aligned} \right\}$$

$$g(n) = \sqrt{(\sqrt{n - \varepsilon} - \sqrt{\varepsilon})^2} = |\sqrt{n - \varepsilon} - \sqrt{\varepsilon}| =$$

$$|\sqrt{n - \varepsilon} - 2|$$

$$\left\{ \begin{aligned} \text{if } \sqrt{n - \varepsilon} \geq 2 &\rightarrow n - \varepsilon \geq 4 \Rightarrow n \geq 8 \rightarrow \\ g(n) &= \sqrt{n - \varepsilon} - 2 \end{aligned} \right.$$

$$\left\{ \begin{aligned} \text{if } \sqrt{n - \varepsilon} < 2 &\rightarrow n - \varepsilon < 4 \rightarrow \varepsilon \leq n < 8 \\ g(n) &= -(\sqrt{n - \varepsilon} - 2) = 2 - \sqrt{n - \varepsilon} \end{aligned} \right.$$

$$t = \sqrt{n - \varepsilon} \rightarrow f(n) = t + 2$$

$$g(n) = |t - 2| \rightarrow n \geq \varepsilon \rightarrow t = \sqrt{n - \varepsilon}, n \geq \varepsilon \rightarrow t - 2$$

$$f(n) + g(n) = (t + 2) + (t - 2) = 2t = 2\sqrt{n - \varepsilon} \rightarrow c = -\varepsilon$$

$$b + a = 2$$

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

پیرامی

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$$f(m) = \frac{m+2}{m^2-5m+3}$$

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

$$\frac{g(m)}{f(m)} = g(m) \times \frac{1}{f(m)} \rightarrow \begin{aligned} 1 \times \frac{1}{-5} &= -\frac{1}{5} \\ 5 \times \frac{1}{5} &= 1 \end{aligned}$$

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

$$g(1) = 0 \quad f(1) = 0 =$$

$$g(3) = 4 \quad f(3) = 0 =$$

$$g(0) = 4 \quad f(0) = \frac{2}{3}$$

$$\frac{g}{f} = \{(2, -\frac{1}{5}), (0, 4)\}$$

$$f(m) = \{(1, 2), (3, -1), (5, 2), (-1, 4)\}$$

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

$$f(2m) = \{(0, 0, 2), (1, 0, -1), (2, 2), (-0, 0, 4)\} \text{ (الف)}$$

$$f(m^2) = \{(\pm 1, 2), (\pm \sqrt{3}, -1), (\pm 2, 2)\}$$

(ب)

$$2g^2(m) + 1 = \{(-2, 19), (1, 3), (3, 9), (-1, 1)\} \text{ (ج)}$$

$$\frac{2f}{g} = \{(1, -5), (3, -1)\}$$

(د)