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ریاضی

آنها مختار دارند

$$\left(\sqrt{n-4} \sqrt{n-4} + \sqrt{n+4} \sqrt{n-4} \right)^2$$

اصل بابت

مختار شود!

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$$n-4\sqrt{n-4} + n+4\sqrt{n-4} - 2\sqrt{n^2-14(n-4)}$$

$$\rightarrow 2n - 2\sqrt{n^2-14(n-4)}$$

$$(n-1)^2$$

$$\rightarrow \sqrt{2n+2|n-1|}$$

$$\rightarrow \sqrt{2n+2n-14}$$

$$\Rightarrow \sqrt{4n-14} = a+b\sqrt{n+c}$$

$$\rightarrow a=0 \quad b=2 \quad c=-4 \quad \rightarrow \frac{4}{-4} = (-1)$$

$$g(n) = \frac{f(n)}{f'(n)}$$

$$f(n) = \begin{cases} (1, -1), (0, \frac{1}{2}) \end{cases}$$

$$f \neq 0 \rightarrow n^2 - 4n + 3 \neq 0 \rightarrow (n-1)(n-3) \neq 0$$

$$n \neq 1 \quad n \neq 3$$

$$f'(n) = \frac{4}{-1} = -4 \rightarrow \frac{g}{f}(n) = \frac{1}{-4} = -\frac{1}{4}$$

$$g/f \rightarrow \left\{ (1, -\frac{1}{4}), (0, \frac{1}{2}) \right\}$$

$$\{ (1, \frac{1}{2}), (0, -1), (2, -1), (-1, \frac{1}{2}) \}$$

$$\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \}$$

$$g \neq 0 \rightarrow n \neq -1$$

$$\{ (1, -4), (4, -1) \}$$

$$f+g \rightarrow \{(1,0), (-1,1), (1,0)\}$$

$$Dg \rightarrow \mathbb{R} \quad / \quad D_n \rightarrow n-1 \neq 0 \rightarrow n \neq 1 \quad \text{و} \quad \sqrt{n} > 0 \rightarrow n > 0$$

$$[x] + [-x] + 1 \Rightarrow Dg = \mathbb{R} \quad \sqrt{n} - n > 0 \rightarrow \sqrt{n} > n$$

$$n \in \mathbb{Z} \rightarrow n \notin \mathbb{R} \quad \text{و} \quad n^2 - n > 0 \rightarrow n(n-1) > 0 \rightarrow n < 0 \text{ or } n > 1$$

$$F = \{(1,0), (1,\sqrt{2}), (1,0)\}$$

$$F_g = \{(1,0), (1,\sqrt{2}), (1,0)\}$$

$$a) y \Rightarrow n^2 - n^2 + n - 1 + 1$$

$$y = (n-1)^2 + 1 \rightarrow y-1 = (n-1)^2 \rightarrow n-1 = \sqrt{y-1} \rightarrow n = \sqrt{y-1} + 1$$

$$1, \sqrt{2}$$

$$b) \frac{1}{n^2 - n} = y \rightarrow y n^2 - n y - 1 = 0 \rightarrow \Delta = (y)^2 - 4(y)(-1) = y^2 + 4y$$

$$\frac{1}{n^2 - n} = y \rightarrow \frac{1}{n(n-1)} = y \rightarrow \frac{1}{n} = y(n-1) \rightarrow \frac{1}{n} = yn - y \rightarrow \frac{1}{n} + y = yn \rightarrow \frac{1}{n} = yn - y \rightarrow \frac{1}{n} = y(n-1)$$

$$a) a > 0 \rightarrow n = \frac{-b}{2a} = \frac{-4}{2} = -2 \Rightarrow \{1, 2\}$$

$$b) a < 0 \rightarrow n = \frac{-b}{2a} = \frac{-4}{-2} = 2 \Rightarrow (-\infty, 12]$$

$$y = \frac{-a+1 \pm \sqrt{a^2+1}}{2a} = 12$$

$$2) a > 0 \rightarrow n = \frac{f}{v} = v_{\min}$$

$$y = f - \lambda - \frac{f}{v} = (-v)_{\min}$$

$$\rightarrow \sqrt{[-v, +\infty)}$$

$$= [0, +\infty)$$

$$3) g = 0 < 0 \rightarrow m = \frac{-g}{\pm v} = v_{\max}$$

$$y \Rightarrow q_{\max}$$

$$\rightarrow \sqrt{(-\infty, q]}$$

$$= \sqrt{[0, 3]}$$

$$4) \rightarrow n^{(3)} = \frac{v}{\lambda} = R$$

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$$1, 5$$

$$5) \rightarrow n^{(4)} \rightarrow R = R$$

$$6) \rightarrow n^{(5)} \rightarrow \frac{R}{f} \rightarrow \sqrt{[-v, +\infty)}$$

$$7) \rightarrow n^{(6)} \rightarrow R_f = (R)^2 = [0, +\infty)$$

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$$8) R = \{3\}$$

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$$9) R = \{4\}$$

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

$$g(n) = \sqrt{x-r-r\sqrt{n-r}+r} = \sqrt{(\sqrt{n-r}-r)^2} = |\sqrt{n-r}-r| \xrightarrow{n \geq 1} \sqrt{n-r}-r$$

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

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

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

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

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

$$R_f = \mathbb{R}$$

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

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

$$\underline{y = 0} \rightarrow 0 = 1 \quad x \text{ صفتی وجود ندارد!} \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$