

۲۰ افزین ت

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$$f(x) = \begin{cases} 2x-1 & (x) > 1 \rightarrow x > 2 \\ 2x+3 & (x) < 1 \rightarrow x < 2 \end{cases}$$

سوال (۲) ←

$$y = \sqrt{f(x) - x + 1} \rightarrow f(x) - x + 1 \geq 0 \begin{cases} x > 2 \rightarrow x > 2 \\ x < 2 \rightarrow \frac{1}{2}x < 2 \end{cases}$$

$$D_f = \left(-\frac{1}{2}, 2\right) \cup [2, +\infty) = \left[-\frac{1}{2}, +\infty\right)$$

$$y = \frac{2x^3 + 3x^2 + 18x + 3}{(x^2 + (x+1))^2} = \frac{2x^3 + 3x^2 + 18x + 3}{((2x+1)^2)^2} \quad \text{سوال (۲) ←}$$

$$\rightarrow \frac{2x^3 + 3x^2 + 18x + 3}{(2x+1)^2} \rightarrow \text{صورت سر بر سر بخشید}$$

$$\frac{2x^3 + 3x^2 + 18x + 3}{(2x+1)^2} \begin{array}{l} 2x+1 \\ 12x^2 + 12x + 3 \\ \hline 2x^3 + 12x^2 + 18x + 3 \\ - (2x^3 + 12x^2) \\ \hline 6x + 3 \\ - (6x + 3) \\ \hline 0 \end{array} \rightarrow \frac{(2x+1)(3)}{(2x+1)^2} = \frac{3}{2x+1}$$

$$\begin{array}{r} 2x^3 + 12x^2 + 18x + 3 \\ - (2x^3 + 12x^2) \\ \hline 6x + 3 \\ - (6x + 3) \\ \hline 0 \end{array}$$

$$\rightarrow \frac{3}{2x+1}$$

$$D_f = R = \frac{3}{2x+1}$$

$$f(x) = \begin{cases} \frac{x^3 + 2x^2 - x - 2}{x^2 - 1} \\ \frac{ax+b}{x+b} \end{cases}$$

سوال (۲) ←

$$\frac{x^3 + 2x^2 - x - 2}{x^2 - 1} \begin{array}{l} x^2 - 1 \\ x^3 + 2x^2 - x - 2 \\ \hline -x^3 + x^2 \\ \hline 3x^2 - x - 2 \\ - (3x^2 - 3) \\ \hline -x + 1 \\ - (-x + 1) \\ \hline 0 \end{array}$$

$$x \neq \pm 1 \rightarrow \begin{cases} x \neq 1 \rightarrow \frac{a+b}{1+b} = 3 \rightarrow 3b-a = -1 \\ x = -1 \rightarrow b+a = 2 \end{cases}$$

Scanned with

$$g(x) = x + C \rightarrow x + C = x + 2 \rightarrow C = 2$$

$$g(1) = 3, g(-1) = 1 \quad b + C = 2 + 1 = 3$$

$$f(x) = \frac{x+1}{x-C}$$

$$\begin{aligned} x - C &= x + 1 \\ C &= -1 \end{aligned}$$

$$g(x) = \frac{x^2 - 1}{x^2 + ax + b} = \frac{(x-1)(x+1)}{x^2 + ax + b} \leftarrow \text{جواب (2)}$$

$$\frac{x+1}{x+1}$$

$$a = 2$$

$$b = 1$$

$$a + b + C = 1 + 1 - 2 = 0$$

$$f(x) = (x-2)^2(x-1)$$

$$\leftarrow \text{جواب (2)}$$

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

$$g(x) = (x-2)^2(x) + (x+2)^2(-x) = x(x^2 - 4x + 4) - x(x^2 + 4x + 4)$$

$$\rightarrow -8x^2$$

$$f(1-2x) = \begin{cases} 2\sqrt{x+2} & x \leq 0 \\ 2\sqrt{x} & x > 0 \end{cases}$$

$$f(-1) + f(2)$$

$$\leftarrow \text{جواب (2)}$$

$$1-2x = -1 \rightarrow 2x = 2 \rightarrow x = 1 \rightarrow 2\sqrt{1+2} = 2\sqrt{3}$$

$$1-2x \leq 2 \rightarrow -2 = 2x \rightarrow x \leq -1 \rightarrow 2\sqrt{-1+2} = 2$$

$$f(x+\sqrt{x}) = x^2 + 4x \quad f(4) = 8 \quad \leftarrow \text{جواب (2)}$$

$$x + \sqrt{x} = 4 \rightarrow x + \sqrt{x} - 4 = 0 \rightarrow (\sqrt{x} + 2)(\sqrt{x} - 2) = 0$$

$$\rightarrow \sqrt{x} = 2 \rightarrow x = 4$$

Scanned

$$\leftarrow \text{جواب (2)}$$

$$f(x) = x^2 + x \rightarrow x(x^2 + 1)$$

(2) ← جواب

$$f(x-1) + f(1-x) = 8$$

↪ y

↪ y

$$\Rightarrow y(y^2+1) + -y(y^2+1)$$

$$\rightarrow y^3+y - y^3-y = \boxed{0} \checkmark$$

$$f(x) = \sqrt{x-2a} + k - 1 \quad g(x) = \sqrt{b-x} + 3k \quad \leftarrow \text{سوال}$$

$$f \cap g = \{(1, k)\} \rightarrow P_f \cap P_g = \{1\} \quad (2)$$

$$\begin{aligned} \rightarrow P_f &\rightarrow [x-2a] \geq 0 \rightarrow x \geq \frac{2a}{2} \rightarrow \frac{2a}{2} \leq 1 \rightarrow 2a \leq 2 \rightarrow a \leq \frac{2}{2} \\ \rightarrow P_g &\rightarrow b-x \geq 0 \rightarrow x \leq \frac{b}{2} \Rightarrow 1 \rightarrow b \leq 2 \end{aligned}$$

$$f(1) = \sqrt{1-2} + k = 1$$

$$g(x) = \sqrt{b-x} + 3k \quad f \cap g = \{(1, k-2k)\}$$

$$\rightarrow -k-2 = k \rightarrow k = -1$$

$$2a - \frac{b}{2} - k = (3) \checkmark$$

$$f(x) = \sqrt{m-x} + n \quad g(x) = \sqrt{x+2} \rightarrow x \geq -1 \quad \leftarrow \text{سوال}$$

$$m-x \geq 0 \rightarrow x \leq m$$

$$P_f \cap g = (-1, \sqrt{2})$$

$$P_g(x) = \sqrt{1-x} + n - \sqrt{1} = 4\sqrt{2}$$

$$\rightarrow 1+n-1\sqrt{2} = 4\sqrt{2} \rightarrow n = 1\sqrt{2}+2$$

$$m+n = 1+1\sqrt{2}+2 = \boxed{3+1\sqrt{2}}$$