

١٩,٥ آئين

دقت كن!

$$2f(\omega) = f(-2) \rightarrow 3a - 2 = 2(a+1)(v) \rightarrow 3a - 2 = 14a + 14 \rightarrow 11a = -16 \rightarrow a = -\frac{16}{11}$$

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$$2(a+1)(v) = 3a - 2 + a \rightarrow 14a + 14 = 4a - 2 \rightarrow 10a = -16 \rightarrow a = -\frac{8}{5}$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2$$

$$x = 2 + \sqrt{2} \xrightarrow{\text{نقطه}} \frac{1}{2 - \sqrt{2}} \times \frac{2 + \sqrt{2}}{2 + \sqrt{2}} = \frac{2 + \sqrt{2}}{2 - 2} = \frac{2 + \sqrt{2}}{0} \Rightarrow x + \frac{1}{x} = 2 + \sqrt{2} + \frac{1}{2 + \sqrt{2}} = 2 + \sqrt{2} + \frac{2 - \sqrt{2}}{2 - 2} = 2 + \sqrt{2} + \frac{2 - \sqrt{2}}{0}$$

$$\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 = x + \frac{1}{x} + 2 \rightarrow 2 + 2 = 4 \Rightarrow \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 = 4 \rightarrow \sqrt{x} + \frac{1}{\sqrt{x}} = 2 \rightarrow f(2 + \sqrt{2}) = 2 + \sqrt{2} + 2 = 4 + \sqrt{2}$$

$$f(2 - \sqrt{2}) = f(2 + \sqrt{2}) \Rightarrow 2f(2 + \sqrt{2}) = 2(4 + \sqrt{2}) = 8 + 2\sqrt{2}$$

$$2f(x) - 3f(-x) = 2x^2 - x \rightarrow 2f(x) - 9f(-x) = 11x^2 - 2x$$

$$x = -x \Rightarrow (2f(-x) - 3f(x) = 2x^2 + x) \times 2 \Rightarrow 4f(-x) - 6f(x) = 12x^2 + 4x \rightarrow -4f(x) = 10x^2 + x \rightarrow f(x) = -\frac{5x^2}{2} - \frac{x}{4}$$

$$(x+2)f(x) - 3xf(x+2) = 2x^2 - mx + 3m - 1 \xrightarrow{x=0} \begin{cases} 2f(0) = 3m - 1 \\ 4f(0) = 10 + 4m \end{cases}$$

$$\Rightarrow \begin{cases} 4f(0) = 3(3m - 1) \\ 4f(0) = 10 + 4m \end{cases} \rightarrow 9m - 3 = 10 + 4m \rightarrow 5m = 13 \rightarrow m = \frac{13}{5}$$

$$2f(0) = 3m - 1 \rightarrow f(0) = \frac{3 \times \frac{13}{5} - 1}{2} = \frac{39 - 5}{10} = \frac{34}{10} = \frac{17}{5}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{3x^2 - 12x + 4}{x}$$

$$ax + b + \frac{a}{x} + b = a\left(x + \frac{1}{x}\right) + 2b = 3x + \frac{4}{x} - 12 \rightarrow a = 3, b = -9$$

$$f(x) = 3x - 9$$

$$f(-1) = -9$$

$$\begin{cases} f(x) = (x-1)\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \rightarrow D_f: (-\infty, 1] \\ g(x) = -\sqrt{(1-x)^3} \rightarrow (1-x)^3 \geq 0 \rightarrow 1-x \geq 0 \rightarrow 1 \geq x \rightarrow D_g: (-\infty, 1] \end{cases} \rightarrow D_f = D_g$$

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$$\begin{cases} f(x) = x\sqrt{x} \rightarrow x \geq 0 \rightarrow [0, +\infty) \\ g(x) = \sqrt{x^3} \rightarrow x^3 \geq 0 \rightarrow x \geq 0 \rightarrow [0, +\infty) \end{cases} \rightarrow$$

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$$\begin{cases} f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow D_f: [0, +\infty) \\ g(x) = \sqrt{x - |x|} \rightarrow x - |x| \geq 0 \rightarrow x \geq |x| \rightarrow D_g: [0, +\infty) \end{cases}$$

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$$*: 0 \leq \sqrt{x} - \lfloor \sqrt{x} \rfloor < 1 \rightarrow f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] = 0$$

$$\text{الف) } \left(\frac{f+g}{f-g} \right)(1) = \frac{f(1)+g(1)}{f(1)-g(1)} = \frac{2+1}{2-1} = 3$$

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

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

$$\hookrightarrow f(1)=2, g(1)=1$$

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$$\text{ب) } \left(\frac{f+g}{f-g} \right)(2) = \frac{f(2)+g(2)}{f(2)-g(2)} = \frac{3+3}{3-3} \rightarrow \text{مخرج برابر صفر است}$$

$$\hookrightarrow f(2)=3, g(2)=3$$

$$\text{ج) } f(0) \times g(-1) = \frac{0}{1} \times 1 = 0$$

$$\text{الف) } g(x) = f(3x-1) \rightarrow \left. \begin{aligned} 3x-1 &= 1 \rightarrow x=1 \\ 3x-1 &= -1 \rightarrow x=0 \\ 3x-1 &= 0 \rightarrow x=\frac{1}{3} \\ 3x-1 &= -2 \rightarrow x=-\frac{1}{3} \\ 3x-1 &= 3 \rightarrow x=\frac{4}{3} \end{aligned} \right\} g(x) = \left\{ (1,1), (0,4), \left(\frac{1}{3}, \omega\right), \left(-\frac{1}{3}, 2\right), \left(\frac{4}{3}, -1\right) \right\}$$

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$$\text{ب) } h(x) = f(|x|)$$

$$\hookrightarrow |x|=0 \rightarrow x=0 \rightarrow f(0)=h(0)=\omega$$

$$|x|=2 \rightarrow x=\pm 2 \rightarrow f(2)=h(2)=1$$

$$|x|=3 \rightarrow x=\pm 3 \rightarrow f(3)=h(3)=-1$$

$$\hookrightarrow h(x) = \{(-3, -1), (-2, 1), (0, \omega), (2, 1), (3, -1)\}$$

$$f(n) = \begin{cases} (a+1)(n+1) & ; n > 1 \\ 1a + 1n & ; n \leq 1 \end{cases}$$

$$, \quad 2f(a) = f(-1) + a$$

$\downarrow$ ضابطہ ۱
 $\downarrow$ ضابطہ ۲

(1)

$$2[(a+1)(a+1)] = 1a + 1(-1) + a \rightarrow 14a + 14 = 1a - 1 \rightarrow 13a = -15 \rightarrow \boxed{a = -15/13}$$