

۲. آزمون عالی نوشتن!

$$2f(\omega) = f(-r) + a \rightarrow 2(Va + V) = 13a - 2 + a \rightarrow 14a + 12 = 14a - 2$$

$$f(\omega) = (a+1)(\omega+2) = Va + V$$

$$f(-r) = 13a + 2(-r) = 13a - 2$$

$$\begin{cases} 14a = -12 \\ a = -\frac{12}{14} \end{cases}$$

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

$$\rightarrow (\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}})^2 = 2 - \sqrt{3} + 2 + \sqrt{3} + 2\sqrt{(2-\sqrt{3})(2+\sqrt{3})} = 4 \rightarrow \sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} = \sqrt{4}$$

$$\rightarrow \frac{\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}}}{\sqrt{2-\sqrt{3}}(\sqrt{2+\sqrt{3}})} = \sqrt{4} \Rightarrow 2\sqrt{4} + 2$$

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$$\begin{cases} 2f(x) - 3f(-x) = 2x^2 - x \xrightarrow{x^2} 4f(x) - 6f(-x) = 4x^2 - 2x \\ 2f(-x) - 3f(x) = 2x^2 + x \xrightarrow{x^2} 4f(-x) - 6f(x) = 4x^2 + 3x \end{cases} \quad \textcircled{+}$$

$$\rightarrow -4f(x) = 20x^2 + x \rightarrow f(x) = -\frac{5x^2 + \frac{x}{4}}{1}$$

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$$\begin{aligned} x=0 & \rightarrow 2f(0) - 3x_0 f(r) = 2m-1 \\ x=-r & \rightarrow f(-r) + 4f(0) = 14 + 2m + 3m-1 \end{aligned} \rightarrow \begin{cases} 2f(0) = 2m-1 \xrightarrow{x^2} 4f(0) = 4m-2 \\ 4f(0) = 5m+15 \end{cases}$$

$$\Rightarrow 5m+15 = 4m-2 \Rightarrow 11 = -m \rightarrow m = -11 \rightarrow 2f(0) = 2(-11) - 1 = -23 \rightarrow f(0) = -\frac{23}{2}$$

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$$x=-1 \rightarrow f(-1) + f(1) = \frac{2(-1)^2 - 12(-1) + 3}{-1} = \frac{14 + 12 + 3}{-1} = -29 \rightarrow 2f(-1) = -29 \rightarrow f(-1) = -\frac{29}{2}$$

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برابر است

$$f(x) = (x-1)\sqrt{1-x} \rightarrow 1-x \geq 0 \rightarrow x \leq 1 \quad \text{Df}$$

$$g(x) = -\sqrt{(1-x)^3} \rightarrow (1-x)^3 \geq 0 \rightarrow 1-x \geq 0 \rightarrow x \leq 1 \quad \text{Dg}$$

$$\downarrow$$

$$-|1-x|\sqrt{1-x} \rightarrow (x-1)\sqrt{1-x} \quad \checkmark$$

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$$f(x) = x\sqrt{x} \rightarrow x \geq 0 \quad \text{Df}$$

برابر است

$$g(x) = \sqrt{x^3} \rightarrow x^3 \geq 0 \rightarrow x \geq 0 \quad \text{Dg}$$

$$\downarrow$$

$$|x|\sqrt{x} \rightarrow x\sqrt{x}$$

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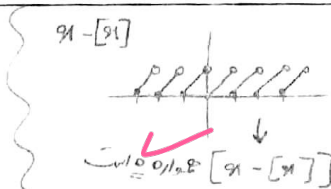
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$$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \rightarrow x \geq 0 \quad \text{Df} \rightarrow 0, 1, 2, \dots$$

$$g(x) = \sqrt{x-|x|} \rightarrow x-|x| \geq 0 \rightarrow x \geq |x| \rightarrow x \geq 0 \quad \text{Dg}$$

$$\downarrow$$

$$= 0 \quad 0, 1, 2, \dots$$



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الف) $\frac{f(1) + g(1)}{f(1) - g(1)} = \frac{2+1}{2-1} = 3 \quad \checkmark$

ج) $f(0)g(-1) = (0)(1) = 0 \quad \checkmark$

ب) $\frac{f(2) + g(2)}{f(2) - g(2)} = \frac{2+2}{2-2} = \text{undefined} \quad \checkmark$

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الف) $f(3x-1) = g(x)$

$3x-1 = 2 \rightarrow x = 1 \rightarrow g(1) = 1$
 $3x-1 = -1 \rightarrow x = 0 \rightarrow g(0) = 2$
 $3x-1 = 0 \rightarrow x = \frac{1}{3} \rightarrow g(\frac{1}{3}) = \infty$
 $3x-1 = -2 \rightarrow x = -\frac{1}{3} \rightarrow g(-\frac{1}{3}) = 2$
 $3x-1 = 3 \rightarrow x = \frac{4}{3} \rightarrow g(\frac{4}{3}) = -1$

ب) $g(x) = f(|x|)$

$|x| = 2 \rightarrow x = 2 \rightarrow g(2) = 1$
 $\rightarrow x = -2 \rightarrow g(-2) = 1$
 $|x| = 0 \rightarrow x = 0 \rightarrow g(0) = \infty$
 $|x| = 3 \rightarrow x = -3 \rightarrow g(-3) = -1$
 $\rightarrow x = 3 \rightarrow g(3) = -1$

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$$g(x) = \{(1,1), (0,2), (\frac{1}{3}, \infty), (-\frac{1}{3}, 2), (\frac{4}{3}, -1)\}$$

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