

۲. از بین موارد زیر

$$f(x) \begin{cases} (a+1)(x+2) : x > 1 \\ Ca + 2x : x \leq 1 \end{cases} \quad \begin{cases} 2f(x) = f(x-1) + a \\ \downarrow \quad \quad \downarrow \quad \downarrow \\ 12a + 12 = Ca - 2 + a \\ 10a = -14 \rightarrow a = -1.4 \end{cases}$$

$$f(x) = 7a + 7$$

$$f(x-1) = -2 + Ca$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2 \quad \begin{cases} f(x-\sqrt{x}) + f(x+\sqrt{x}) = 8 \end{cases}$$

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

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

$$A = 2\sqrt{x-\sqrt{x}} + 2 + \sqrt{x+\sqrt{x}} + 2\sqrt{x-\sqrt{x}} = 6 \rightarrow A = \sqrt{6} \Rightarrow \text{جواب} = 2\sqrt{6} + 8$$

$$2f(x) - Cf(x-1) = 2x^2 - x \xrightarrow{x^2} 4f(x) - 9f(x-1) = 4x^2 - 2x$$

$$2f(x-1) - Cf(x) = 2x^2 + x \xrightarrow{x^2} -9f(x) + 4f(x-1) = 4x^2 + 2x$$

$$f(x) = -2x^2 + \frac{-x}{2}$$

$$-5f(x) = 10x^2 + x$$

$$(x+2)f(x) - Cxf(x+1) = 2x^2 - mx + Cm - 1$$

$$x = -2 \rightarrow 4f(0) = 12 + 2m + Cm - 1 \rightarrow 4f(0) = 12 + 2m \quad \text{I}$$

$$x = 0 \rightarrow 2f(0) = Cm - 1 \rightarrow 4f(0) = 2m - C \quad \text{II}$$

$$\text{I}, \text{II} \Rightarrow 2m + 12 = 2m - C \rightarrow 2m = 14 \Rightarrow m = 7$$

$$\text{I} \Rightarrow 4f(0) = 12 + 2 \cdot 7 = 26 \rightarrow \frac{26}{4} = f(0) \rightarrow f(0) = \frac{13}{2} = 6.5$$

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

$$x = -1 \rightarrow 2f(-1) = -(C + 12 + C) = -14 \rightarrow f(-1) = -7$$

$$f(x) = (x-1)\sqrt{1-x} \rightarrow x \leq 1 \quad \Rightarrow D_f = D_g$$

$$g(x) = -\sqrt{(1-x)^3} \rightarrow x \leq 1$$

تابع با هم برابرند

$$f(x) = x\sqrt{x} \rightarrow x \geq 0, \quad f(x) = \sqrt{x^3} = \sqrt{x^2} \sqrt{x} = \sqrt{x^2} \sqrt{x} = \sqrt{x^3}$$

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

تابع با هم برابرند

$$f(x) = \lfloor \sqrt{x} \rfloor - \lfloor \sqrt{x} \rfloor \rightarrow \lfloor \sqrt{x} \rfloor \leq \sqrt{x} \rightarrow \lfloor \sqrt{x} \rfloor - \lfloor \sqrt{x} \rfloor = 0$$

$$g(x) = \sqrt{x - |x|} \rightarrow x \geq 0 \Rightarrow g(x) = 0$$

تابع با هم برابرند

$$f = \{(1, 2), (2, 1), (3, 1), (0, 0)\} \quad g = \{(-1, 1), (1, 1), (2, 1), (3, 1), (0, 1), (5, 1)\}$$

الف)  $\left(\frac{f+g}{f-g}\right)(1) \rightarrow \left\{ \begin{matrix} f(1)=2 \\ g(1)=1 \end{matrix} \right\} \Rightarrow \frac{2+1}{2-1} = 3$

ب)  $\left(\frac{f+g}{f-g}\right)(2) \rightarrow \left\{ \begin{matrix} f(2)=1 \\ g(2)=1 \end{matrix} \right\} \Rightarrow \frac{1+1}{1-1} = \frac{2}{0} \rightarrow \text{تعریف نشده}$

ج)  $f(0)g(-1) \rightarrow \left\{ \begin{matrix} f(0)=0 \\ g(-1)=1 \end{matrix} \right\} \Rightarrow 0 \times 1 = 0$

$$f(x) = \{(2, 1), (-1, 2), (0, 2), (-2, 2), (2, -1)\}$$

الف)  $g(x) = f(x-1) \rightarrow \{(1, 1), (0, 2), (\frac{1}{2}, 2), (\frac{1}{2}, 1), (\frac{2}{2}, -1)\}$

ب)  $h(x) = f(|x|) \rightarrow \{(\pm 2, 1), (-1, 2), (0, 2), (-2, 2), (\pm 2, -1)\}$