

$$2(a+1)(a+2) = 3a + 2(-2) + a$$

$$14a + 14 = 4a - 4 \rightarrow 10a = -18 \rightarrow a = -1.8$$

سوال (۱)

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

سوال (۲)

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

$$\star: \frac{1}{\sqrt{2-\sqrt{3}}} \times \frac{\sqrt{2+\sqrt{3}}}{\sqrt{2+\sqrt{3}}} = \frac{\sqrt{2+\sqrt{3}}}{\sqrt{4-3}} = \sqrt{2+\sqrt{3}}$$

$$\star: \frac{1}{\sqrt{2+\sqrt{3}}} \times \frac{\sqrt{2-\sqrt{3}}}{\sqrt{2-\sqrt{3}}} = \frac{\sqrt{2-\sqrt{3}}}{\sqrt{4-3}} = \sqrt{2-\sqrt{3}}$$

$$\begin{cases} 4f(x) - 3f(-x) = 4x^2 - x & \times 2 \\ 4f(-x) - 9f(x) = 4x^2 + x & \times 3 \end{cases}$$

سوال (۳)

$$-5f(x) = 40x^2 + x \rightarrow f(x) = -\frac{40x^2 + x}{5}$$

$$x = -2 \rightarrow 0 - 3(-2)f(0) = 4(-2)^2 - m(-2) + 3m - 1 \rightarrow 4f(0) = 16 + 2m$$

سوال (۴)

$$x = 0 \rightarrow 4f(0) - 0 = 3m - 1$$

$$4f(0) = 9m - 3$$

$$16 + 2m = 9m - 3$$

$$\begin{aligned} 4m &= 19 \\ m &= 4.75 \end{aligned}$$

$$f(0) = \frac{3 \times 4.75 - 1}{4} = 3.4375$$

$$\text{سوال (۵)} \quad x = -1 \rightarrow 4f(-1) = \frac{4(-1)^2 - 12(-1) + 3}{-1} = -18 \rightarrow f(-1) = -4.5$$

سوال (۵)

$$\text{سوال (۶)} \quad ax + b + \frac{a}{x} + b = \frac{3x^2 - 12x + 3}{x} \rightarrow \frac{ax^2 + 2bx + a}{x} = \frac{3x^2 + 2(-4)x + 3}{x} \begin{cases} a=3 \\ b=-4 \end{cases}$$

$$f(x) = 3x - 4$$

$$f(-1) = -3 - 4 = -7$$

$$f(x) \rightarrow |x| \geq 0 \quad D_f = (-\infty, 1]$$

$$g(x) \rightarrow (1-x)^2 \geq 0 \quad D_g = (-\infty, 1]$$

$$\begin{cases} f(x_1) = (x_1-1)\sqrt{1-x_1} \\ g(x_2) = -\sqrt{(1-x_2)^2} \end{cases}$$

$$x_1 = x_2 \rightarrow (x-1)\sqrt{1-x} = -\sqrt{(1-x)^2(1-x)}$$

$$(x-1)\sqrt{1-x} = -|1-x|\sqrt{1-x}$$

$$f(x) = g(x) \leftarrow (x-1)\sqrt{1-x} = -(1-x)\sqrt{1-x}$$

$$\begin{cases} f(x) \rightarrow x \geq 0 & D_f = [0, +\infty) \\ g(x) \rightarrow x^2 \geq 0 \rightarrow x \geq 0 & D_g = [0, +\infty) \end{cases} \quad \begin{cases} f(x_1) = x_1 \sqrt{x_1} \\ g(x_1) = \sqrt{x_1^3} \end{cases} \xrightarrow{x_1 = x_2} x \sqrt{x} \stackrel{?}{=} \sqrt{x^3} \sim \sqrt{x^2 \cdot x}$$

$$x \sqrt{x} = \underbrace{|x|}_{x} \sqrt{x} \Rightarrow x \sqrt{x} = x \sqrt{x} \quad f(x) = g(x)$$

$$D_f \rightarrow x \geq 0 \quad f(x) = [\sqrt{x} - [\sqrt{x}]] \rightarrow \{a - [a] < 1 \rightarrow [a - [a]] = 0$$

$$D_g \rightarrow x \geq |x| \rightarrow x \geq 0$$

$$\oplus \checkmark \quad \ominus \checkmark \quad \ominus \times$$

$$f(x) = 0$$

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

$$f(x) = g(x)$$

الف) $\frac{2+1}{2-1} = 3$ $\checkmark$

ب) $\frac{3+3}{3-3} \Rightarrow$ تعریف نشده $\checkmark$

ج) $0 \times 1 = 0$ $\checkmark$

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

$3x-1=2 \rightarrow x=1$ $3x-1=-1 \rightarrow x=0$ $3x-1=0 \rightarrow x=\frac{1}{3}$ $3x-1=-2 \rightarrow x=-\frac{1}{3}$ $3x-1=3 \rightarrow x=\frac{4}{3}$

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

$|x|=2 \rightarrow x=2, x=-2$ $|x|=-1 \times$ $|x|=0 \rightarrow x=0$ $|x|=-2 \times$ $|x|=3 \rightarrow x=\pm 3$