

$$f(x) = \begin{cases} (a+1)(x+2) & : x > 1 \\ 3a+2x & : x \leq 1 \end{cases} \quad \begin{aligned} f(5) &= f(-2) + a \\ f(a+1)(5) &= 3a - 4 + a \\ 14a + 12 &= 4a - 4 \end{aligned}$$

$$a = 8 \sqrt{\frac{-18}{10}} = -\frac{9}{5} \quad \begin{aligned} 10a &= -18 \\ a &= -1.8 \end{aligned}$$

$$\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 \rightarrow \sqrt{x-\sqrt{x}+2} + \sqrt{x} + 2 = \sqrt{4} \quad (I)$$

$$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}} + 2 \quad f(2-\sqrt{3}) + f(2+\sqrt{3}) = 8$$

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

$$(2-\sqrt{3})(2+\sqrt{3}) = 4-3=1$$

$$\frac{1}{\sqrt{2-\sqrt{3}}} = \sqrt{2+\sqrt{3}} \quad (\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}})^2 = 4 + 2 \cdot \frac{1}{\sqrt{2-\sqrt{3}}(\sqrt{2+\sqrt{3}})} \rightarrow 4$$

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

$$f(x) - f(-x) = 2x^2 - 2 \quad \begin{aligned} 2 \times f(x) - 3f(-x) &= 4x^2 - 2 \rightarrow 2f(x) - 9f(-x) = 4x^2 - 2 \\ 3 \times f(-x) - 4f(x) &= 4x^2 + 2 \rightarrow 9f(-x) - 4f(x) = 12x^2 + 3x \end{aligned}$$

$$f(x) = 9$$

$$\rightarrow -5f(x) = 20x^2 - 2x$$

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

$$(x+2)f(x) - 3mf(x+2) = 4x^2 - mx + 3m - 1$$

$$f(0) = 9 \rightarrow \frac{2 \cdot 0}{-5} - 1 = \frac{2 \cdot 0}{-5} \times \frac{1}{-5} = \frac{2 \cdot 0}{-5} = f(0)$$

$$2f(0) = 3m - 1 \rightarrow x^2 = 2 \quad 4f(0) = 9m - 3 = 15 + 5m$$

$$x = -2 \rightarrow 4f(0) = 14 + 2m + 3m - 1 \quad 4m = 18$$

$$4f(0) = 15 + 5m \quad m = \frac{18}{5} = \frac{9}{2}$$

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

$$f(-1) = 9 \quad f(-1) + f(-1) = \frac{3 + 12 + 2}{-1}$$

$$2f(-1) = -18 \rightarrow f(-1) = -9$$

تساوی تابع ؟ $\begin{cases} f(x) = (x-1)\sqrt{1-x} & 1-x \geq 0 \\ g(x) = -\sqrt{(x+1)^3} & x \leq 1 \end{cases}$ $(-x+1)^3 \geq 0$ $f(x) = g(x)$ $\Rightarrow$ برابرند $\mathbb{R}^+ \checkmark$ $x \leq 1$ $\circ \checkmark$ $\circ \leq x \leq 1 \checkmark$	۶
تساوی تابع ؟ $\begin{cases} f(x) = x\sqrt{x} & x \geq 0 \\ g(x) = \sqrt{x^3} & x \geq 0 \end{cases}$ $\mathbb{R}^+ \checkmark$ $\mathbb{R}^+ \checkmark$ $\mathbb{R}^- \times$ $f(x) = g(x)$	۷
تساوی تابع ؟ $\begin{cases} f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] & x \geq 0 \\ g(x) = \sqrt{x - x } & x \geq 0 \end{cases}$ $\Rightarrow \sqrt{x} - \lfloor \sqrt{x} \rfloor < 1$ $f(x) = 0$ $\mathbb{R}^- \times$ $\mathbb{R}^+ \checkmark$ $\Rightarrow f(x) = g(x)$ $\Rightarrow$ برابرند	۸
$g = \{(-1, 0), (1, 0), (2, 3), (3, 5), (0, 2), (\sqrt{5}, 1)\}$ $f = \{(1, 2), (2, 3), (3, 1), (0, 0)\}$ الف) $\left(\frac{f+g}{f-g}\right)(1) = \frac{3}{1} = 3$ ب) $\left(\frac{f+g}{f-g}\right)(2) = \frac{9}{0}$ (تعریف نشده) ج) $f(-1) = 0 \times 1 = 0$	۹
$f(x) = \{(2, 1), (-1, 2), (0, 5), (-2, 2), (3, -1)\}$ $3x = -1 \Rightarrow x = -\frac{1}{3}$ الف) $g(x) = f(3x-1)$ $3x = 3 \Rightarrow x = 1$ $3x = 0 \Rightarrow x = 0$ $3x = 1 \Rightarrow x = \frac{1}{3}$ $3x = 2 \Rightarrow x = \frac{2}{3}$ $3x-1 = 0 \Rightarrow 3x = 1 \Rightarrow x = \frac{1}{3}$ $3x-1 = 2 \Rightarrow 3x = 3 \Rightarrow x = 1$ $3x-1 = -1 \Rightarrow 3x = 0 \Rightarrow x = 0$ $3x-1 = 3 \Rightarrow 3x = 4 \Rightarrow x = \frac{4}{3}$ ب) $h(x) = f(x)$ $x = 2 \Rightarrow x = \pm 2$ $x = -1 \times$ $x = 0 \Rightarrow x = 0$ $x = 3 \Rightarrow x = \pm 3$ $h(x) = \{(-3, -1), (-2, 1), (0, 5), (2, 1), (3, -1)\}$	۱۰