

$$f(x) = \begin{cases} (a+1)(x+2) & x > 1 \\ 2a+2x & x < 1 \end{cases} \quad 2f(\omega) = f(-2) + a$$

$$f(\omega) = (a+1)(\omega) = \omega a + \omega$$

$$f(-2) = 2a - 2$$

$$\Rightarrow 2(\omega a + \omega) = 2a - 2 + a \rightarrow 1\omega a + 1\omega = 2a - 2$$

$$\rightarrow 10a = -18 \rightarrow \boxed{a = -1.8}$$

1

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

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

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

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

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

2

$$(2f(x) - 3f(-x)) = 4x^2 - x \quad 4f(x) - 9f(-x) = 18x^2 - 2x$$

$$(2f(-x) - 3f(x)) = 4x^2 + x \quad 4f(-x) - 9f(x) = 12x^2 + 3x$$

$$\rightarrow \boxed{f(x) = 4x^2 - \frac{x}{2}}$$

3

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

$$f(0) \rightarrow 2f(0) - 0 = 3m - 1 \rightarrow f(0) = \frac{3m-1}{2} \rightarrow \frac{4f(\omega) - 1}{2} = \boxed{4, 2\omega = f(0)}$$

$$f(-2) \rightarrow 0 + 9f(0) = 12 + 2m \rightarrow f(0) = \frac{12+2m}{9}$$

$$\frac{12+2m}{9} = \frac{3m-1}{2} \rightarrow 9m - 3 = 12 + 2m \rightarrow 7m = 15 \rightarrow \underline{m = 1.5}$$

4

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

$$f(-1) \rightarrow \underbrace{f(-1) + f(-1)}_{2f(-1)} = -4 - 12 - 3 = -19 \Rightarrow \boxed{f(-1) = -9.5}$$

5

۶	$f(x) = (x-1)\sqrt{1-x} \Rightarrow D_f = 1-x \geq 0 \rightarrow x \leq 1 \quad / R_f = (-\infty, 0]$ $g(x) = -\sqrt{(1-x)^3} \Rightarrow D_g = 1-x \geq 0 \rightarrow x \leq 1 \quad / R_g = (-\infty, 0]$ حرد ۰ می‌شوند $\rightarrow$ حرد ۱- می‌شوند $\rightarrow$ ۴- مثال
۷	$f(x) = [\sqrt{x} - [\sqrt{x}]] \Rightarrow D_f = x \geq 0 \quad / R_f = \{0\}$ این جواب سوال هسته می‌شود استیاده شد! $\odot$ $g(x) = \sqrt{x-1} \quad x \geq 1 \Rightarrow D_g = x \geq 1 \quad / R_g = \{0\}$ حالا این سوالو تو بعضی می‌نویسم راجعا شهرمنده! حرد ۰ می‌شوند $\rightarrow$ ۱- مثال حرد ۰ می‌شوند $\rightarrow$ ۹
۸	$f(x) = x\sqrt{x} \Rightarrow D_f = x \geq 0 \quad / R_f = [0, +\infty)$ حرد ۰ می‌شوند $\rightarrow$ ۰- مثال حرد ۱ می‌شوند $\rightarrow$ ۱ حرد ۲ می‌شوند $\rightarrow$ ۲ $g(x) = \sqrt{x^3} \Rightarrow D_g = x \geq 0 \quad / R_g = [0, +\infty)$ زیر رادیکال حده بسته
۹	$f = \{(1,2)(2,3)(3,1)(0,0)\} \quad g = \{(-1,1)(1,1)(2,3)(3,5)(0,2)(\sqrt{5},1)\}$ $\left(\frac{f+g}{f-g}\right)(1) = \left\{ (1, \frac{4}{0}) (\cancel{2, \frac{4}{0}}) (3, \frac{3}{-1}) (0, -1) \right\}$ $\left(\frac{f+g}{f-g}\right)(2) = \left\{ (1, -\frac{3}{2}) \right\}$ $f(0) \times g(-1) = 0 \times 1 = [0]$
۱۰	$f(x) = \{(2,1)(-1,4)(0,5)(-2,2)(3,-1)\}$ $g(x) = f(x-1)$ $\begin{aligned} &\rightarrow x-1=2 \rightarrow x=3 \rightarrow x-1=3 \rightarrow x=\frac{4}{3} \\ &\rightarrow x-1=-1 \rightarrow x=0 \rightarrow x-1=-2 \rightarrow x=-\frac{1}{3} \\ &\rightarrow x-1=0 \rightarrow x=1 \end{aligned}$ $g(x) = \{(1,1)(\frac{4}{3},-1)(0,4)(-\frac{1}{3},2)(\frac{1}{3},5)\}$ $h(x) = f(1/x) \rightarrow \{(2,1)(-2,1)(0,5)(3,-1)(-3,-1)\}$