

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

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

$$f(a+1) = f(a) - f(-1)$$

$$10a = -18 \Rightarrow a = -\frac{18}{10}$$

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

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

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

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$$f(x) - f(-x) = x^2 - x \Rightarrow f(x) - f(-x) = 18x^2 - 12x$$

$$f(-x) - f(x) = x^2 + x \Rightarrow -f(x) + f(-x) = 18x^2 + 12x$$

$$\frac{-f(x)}{-1} = \frac{18x^2 + 12x}{-1}$$

$$f(x) = \frac{18x^2 + 12x}{-1} = -18x^2 - 12x$$

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$$x=0 \rightarrow \frac{f(0)}{x} = \frac{18m-1}{1}$$

$$\frac{18m-1}{1} = \frac{18+18m}{18}$$

$$x+1=0 \Rightarrow x=-1 \rightarrow f(-1) = f(-1) - m(-1) + 18m-1$$

$$18m-1 = 18+18m$$

$$f(0) = 18+18m+18m-1$$

$$\frac{18m}{18} = \frac{18}{18} = \frac{1}{1}$$

$$\frac{f(0)}{18} = \frac{18+18m}{18}$$

$$f(0) = \frac{18}{18} - \frac{1}{18} = \frac{17}{18}$$

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$$f(x) + f\left(\frac{1}{x}\right) = 18x - 12 + \frac{18}{x} \quad x \neq 0$$

$$x=-1 \rightarrow f(-1) + f(-1) = 18(-1) - 12 + \frac{18}{-1}$$

$$2f(-1) = -18 - 12 - 18 = -48$$

$$f(-1) = -24$$

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$f(x) = (x-1)\sqrt{1-x} \rightarrow x \leq 1$ $g(x) = -\sqrt{(1-x)^3} = - 1-x \sqrt{1-x} = - 1-x \sqrt{1-x} \rightarrow \mathbb{R}$ $\quad \quad \quad \uparrow$ $\quad \quad \quad (1-x)^2(1-x)$	$f(x) \neq g(x)$ $D_f \neq D_g$ $\times$	6
$f(x) = x\sqrt{x} \rightarrow D_f = [0, +\infty)$ $g(x) = \sqrt{x^3} = x \sqrt{x} \rightarrow D_g = [0, +\infty)$ $\quad \quad \quad \uparrow$ $\quad \quad \quad x^2(x)$	$f(x) = g(x)$ $D_f = D_g$ $\checkmark$	7
$f(x) = \left[\sqrt{x} - \lceil \sqrt{x} \rceil \right] = \lceil \sqrt{x} \rceil - \lceil \sqrt{x} \rceil = 0$ $D_f = [0, +\infty)$ $\quad \quad \quad \uparrow$ $\quad \quad \quad x \geq 0$	$D_g = D_f$ $\checkmark$	8
$f = \left\{ \frac{(1,2)}{(2,3)} \frac{(3,1)}{(0,0)} \right\}$ الف) $\left(\frac{y+1}{y-1} \right) = 3$ ب) $\left(\frac{y+3}{y-3} \right) = 0$ ج) $f(0)g(-1) = 0 \times 1 = 0$	$g = \left\{ \frac{(-1,1)}{(1,1)} \frac{(2,3)}{(3,0)} \frac{(0,2)}{(\sqrt{5},1)} \right\}$	9
الف) $g(x) = f(3x-1)$ $g(x) = \left\{ (1,1)(0,2)\left(\frac{1}{3},0\right)\left(-\frac{1}{3},2\right)\left(\frac{4}{3},-1\right) \right\}$ ب) $h(x) = f(x)$	$3x-1=1 \Rightarrow x=2$ $3x-1=-1 \Rightarrow x=0$ $3x-1=0 \Rightarrow x=\frac{1}{3}$ $ x =2 \quad x=\pm 2$ $ x =-1 \quad x =-1 \times$ $ x =0 \quad x=0$ $ x =3 \quad x=\pm 3$	10

∴ المسألة