

$$f(x) = \begin{cases} (a+1)(x+1) & ; x > 1 \\ 3a+2x & ; x \leq 1 \end{cases}$$

$$f(-1) = 3a - 2 \rightarrow f_a - f = 14a + 14 = -18 = 10a \Rightarrow a = -\frac{9}{5}$$

$$f(0) = 7a + 2$$

1

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

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

2

$$f(x) - f(-x) = 2x^2 - x$$

$$f(-x) - 3f(x) = 2x^2 + x$$

$$-4f(x) = 2x^2 + x \rightarrow f(x) = -\frac{1}{2}x^2 - \frac{x}{4}$$

3

$$(x+1)f(x) - 3xf(x+1) = 2x^2 - mx + m - 1 \rightarrow \text{...}$$

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

$$(0+1)f(0) - 3(0)f(1) = 2(0)^2 - m(0) + m - 1$$

$$f(0) = m - 1 \rightarrow f(0) = \frac{m-1}{2} \xrightarrow{m=\frac{9}{4}} f(0) = \frac{7}{8}$$

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

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

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

$$3(\frac{m-1}{2}) = 1 + m \rightarrow m = \frac{9}{4}$$

$$f(x)f(\frac{1}{x}) = ax + b + \frac{a}{x} \rightarrow 2x - 1 + \frac{2}{x} = f(x) + f(\frac{1}{x}) = ax + b + \frac{a}{x} + b$$

$$f(-1) = -9$$

$$\rightarrow f(x) = 2x - 1$$

$$f(-1) = -9$$

$f(x) = (x-1)\sqrt{1-x} \xrightarrow{-\sqrt{1-x}^2 \sqrt{1-x} \rightarrow -\sqrt{1-x}^3}$ $g(x) = \sqrt{1-x}^2$ س.س.	٤
$f(x) = x\sqrt{x} \rightarrow x \geq 0 \rightarrow \sqrt{x}^3$ $g(x) = \sqrt{x}^2 \quad x \geq 0$ س.س.	٧
$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor]$ $g(x) = \sqrt{x - x }$ X $x - x \geq 0 \rightarrow x \geq 0 \rightarrow x - x = 0$ $x < 0 \rightarrow x - x \rightarrow 2x < 0$ $x=1 \rightarrow f(x) = [\sqrt{1} - 1]$ $x=1 \rightarrow g(x) = 0$	٨
$\left(\frac{f+g}{f-g} \right) \xrightarrow{f(1)=1, g(1)=1} \frac{1+1}{1-1} = \infty$ $\left(\frac{f+g}{f-g} \right) \cdot \frac{f(x)=1}{g(x)=1} \neq 0 \quad X$ $f(0)g(1) = 1 \times 0 = 0$	٩
$g(x) = f(x-1) \rightarrow 2x-1=2 \rightarrow x=1 \rightarrow g_1 = f(x) = 1$ $2x-1 = -1 \rightarrow x=0 \rightarrow g(0) = f(-1) = 1$ $g = \{(1,1), (0,1), (-1,1), (-2,1), (-3,1), \dots\}$ $h(x) = f(x) \rightarrow x =2 \rightarrow x = \pm 2 \therefore h(2) = h(-2) = f(2) = 1$ $ x =0 \rightarrow h(0) = f(0) = 0$ $ x =1 \rightarrow h(1) = h(-1) = f(1) = 1$	١٠
$h = \{(1,1), (-1,1), (0,0), (2,1), (-2,1), \dots\}$	