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

$$\begin{aligned} f(\Delta) &= f(-1) + a \\ f(a+1)(1) &= 2a - 1 + a \end{aligned}$$

$$12a + 12 = 2a - 1 \Rightarrow \frac{10a}{1} = \frac{-13}{1} \Rightarrow a = -1.3$$

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

$$* = \sqrt{1-\sqrt{3}} + \frac{1}{\sqrt{1-\sqrt{3}}} + 2 + \sqrt{1+\sqrt{3}} + \frac{1}{\sqrt{1+\sqrt{3}}} + 2 = 4 + \sqrt{4} + \sqrt{4} = 4 + 2 + 2 = 8$$

$$① (\sqrt{1-\sqrt{3}} + \sqrt{1+\sqrt{3}}) = A^2 \Rightarrow 1-\sqrt{3} + 1+\sqrt{3} + 2(\sqrt{1-\sqrt{3}})(\sqrt{1+\sqrt{3}}) = 2+2+2 = 6 = \sqrt{6} = A^2$$

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

$$f(x) = ?$$

$$x^1 \quad 2f(x) - 2f(-x) = 2x^2 - x$$

$$x^2 \quad 2f(-x) - 2f(x) = \frac{2(-x)^2}{2x^2} + x$$

$$\begin{cases} 2f(x) - 2f(-x) = 2x^2 - x \\ 2f(-x) - 2f(x) = \frac{2(-x)^2}{2x^2} + x \end{cases}$$

$$\frac{-\Delta f(x)}{-\Delta} = \frac{2x^2 + x}{-\Delta} \Rightarrow f(x) = -x^2 - \frac{x}{\Delta}$$

$$(x+1)f(x) - 2xf(x+1) = 2x^2 - mx + 2m-1 \quad \begin{cases} 12f(0) - 12m = 4\Delta \\ -1.f(0) + 12m = 4\Delta \end{cases}$$

$$(-1+1)f(-1) - 2(-1)f(0) = 2(-1)^2 - m(-1) + 2m-1 \quad \begin{cases} 12f(0) - 12m = 4\Delta \\ -1.f(0) + 12m = 4\Delta \end{cases}$$

$$x+1=0 \Rightarrow x=-1$$

$$\begin{cases} 4f(0) = 12 + 2m + 2m-1 \\ 4f(0) = 12 + 2m + 2m-1 \end{cases} \Rightarrow \begin{cases} 4f(0) = 12 + 4m-1 \\ 4f(0) = 12 + 4m-1 \end{cases}$$

$$x=0 \Rightarrow 2f(0) - 2f(0) = f(0) - m(0) + 2m-1 \Rightarrow 2f(0) = 2m-1$$

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

$$f(-1) = ?$$

$$① f(-1) + f(-1) = \frac{2(-1)^2 - 12(-1) + 2}{-1} = -18 \Rightarrow 2f(-1) = -18 \Rightarrow f(-1) = -9$$

$$② \rightarrow ax + b + \frac{a}{x} + b = \frac{2x^2 - 12x + 2}{x} \Rightarrow ax + \frac{a}{x} + 2b = 2x - 12 + \frac{2}{x} \Rightarrow a = 2, b = -9$$

$$f(x) = (x-1)\sqrt{1-x} \Rightarrow 1-x \geq 0 \Rightarrow x \leq 1 \Rightarrow D_f = (-\infty, 1]$$

$$g(x) = -\frac{\sqrt{(1-x)^3}}{(1-x)^2(1-x)} \Rightarrow 1-x \geq 0 \Rightarrow x \leq 1 \Rightarrow D_g = (-\infty, 1]$$

$$-1 \frac{(1-x)\sqrt{1-x}}{(1-x)^2} \Rightarrow (x-1)\sqrt{1-x}$$

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$$f(x) = x\sqrt{x} \Rightarrow x \geq 0 \Rightarrow D_f = [0, +\infty)$$

$$g(x) = \frac{\sqrt{x^3}}{\sqrt{x^2 \cdot x}} \Rightarrow x \geq 0 \Rightarrow D_g = [0, +\infty)$$

$$\frac{\sqrt{x^3}}{\sqrt{x^2 \cdot x}} = \frac{\sqrt{x^3}}{\sqrt{x^3}} = 1$$

$$f(x) = x\sqrt{x} \Rightarrow x^2 = 1 \Rightarrow x = \pm 1$$

$$g(x) = \sqrt{x^2} = |x| = 1$$

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$$f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \Rightarrow \sqrt{x} \geq 0 \Rightarrow x \geq 0 \Rightarrow [\sqrt{x}] \leq \sqrt{x}$$

$$[\sqrt{x} - \lfloor \sqrt{x} \rfloor] = 0$$

$$[\sqrt{x} - \lfloor \sqrt{x} \rfloor] = 1 \Rightarrow \sqrt{x} = \lfloor \sqrt{x} \rfloor + 1 \Rightarrow \sqrt{x} = n + 1 \Rightarrow x = (n+1)^2$$

$$g(x) = \sqrt{x-|x|} \Rightarrow x-|x| \geq 0 \Rightarrow x \geq |x| \Rightarrow [0, +\infty)$$

$$\begin{cases} x < 0 \Rightarrow x - (-x) = 2x < 0 \\ x \geq 0 \Rightarrow x - x = 0 \end{cases} \Rightarrow g(x) = 0$$

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$$f(x) = (x-1)(x+1)(x-2)(x+3)(x-4)(x+5) \dots$$

$$f(1) = 0 \Rightarrow \frac{f(1)+g(1)}{f(1)-g(1)} = \frac{0+1}{0-1} = -1$$

$$f(2) = 0 \Rightarrow \frac{f(2)+g(2)}{f(2)-g(2)} = \frac{0+4}{0-4} = -1$$

$$g(x) = f(x) \Rightarrow g(1) = 0$$

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$$g(x) = f(x-1) \Rightarrow f(x) = \{(x-1)(x-2)(x-3)(x-4)(x-5)(x-6)\}$$

$$g(x) = f(x-1)$$

$$\begin{aligned} x-1 &= 1 \Rightarrow x=2 \\ x-1 &= 2 \Rightarrow x=3 \\ x-1 &= 3 \Rightarrow x=4 \\ x-1 &= 4 \Rightarrow x=5 \\ x-1 &= 5 \Rightarrow x=6 \end{aligned}$$

$$h(x) = f(x-1)$$

$$\begin{aligned} |x| &= 1 \Rightarrow x = \pm 1 \\ |x| &= -1 \Rightarrow \text{no solution} \\ |x| &= 0 \Rightarrow x = 0 \end{aligned}$$

$$h(x) = (x-1)(x-2)(x-3)(x-4)(x-5)(x-6)$$

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