

$$(1) \quad Y(a+1) \left( \frac{1}{X} \right) = Y a - \frac{1}{X}, a$$

$$1/a + 1/X = \frac{1}{X} a - \frac{1}{X} \quad \text{so } a = -1 \Rightarrow a = \underline{-1/X}$$

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

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

$$\Rightarrow 2\sqrt{x - \sqrt{x}} + 2\sqrt{x + \sqrt{x}} = 2(\sqrt{x - \sqrt{x}} + \sqrt{x + \sqrt{x}}) + 4 = \underline{4\sqrt{x}}$$

$$(3) \quad (2f(x) - 4f(-x) = x^2 - 4) \times 2 \Rightarrow 8f(x) - 4f(-x) = 2x^2 - 8$$

$$(2f(-x) - 4f(x) = x^2 + 4) \times 2$$

$$\Rightarrow 4f(-x) - 4f(x) = x^2 + 4$$

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

$$(4) \quad n=0 \rightarrow 2f(0) = 4m-1 \rightarrow f(0) = \frac{4m-1}{2}$$

$$n=-1 \rightarrow 4f(0) = 14 + 4m + 4m-1 \rightarrow f(0) = \frac{13 + 8m}{4}$$

$$\frac{4m-1}{2} = \frac{13 + 8m}{4} \Rightarrow 4m-1 = 13 + 8m \Rightarrow m = \underline{-\frac{14}{4}}$$

$$f(0) = \underline{\frac{13}{2}}$$

$$\textcircled{2} f(-1) + f\left(\frac{1}{-1}\right) = 3 - 12 = -9 \xrightarrow{\div 3} f(-1) = -9$$

$$\textcircled{3} f(x) \rightarrow 1-x \geq 0 \rightarrow x \leq 1, \quad g(x) \rightarrow (1-x)^2 \rightarrow x \leq 1$$

برای  $x \leq 1$

$$(x-1)\sqrt{1-x} \rightarrow -(1-x)\sqrt{1-x} = -\sqrt{(1-x)^3} = g(x)$$

برای  $x \leq 1$

$$\textcircled{4} f(x) \rightarrow x \geq 0, \quad g(x) \rightarrow x^2 \rightarrow x \geq 0$$

برای  $x \geq 0$

$$\textcircled{5} f(x) = \left[ \sqrt{x} \cdot \left[ \sqrt{x} \right] \right], \quad g(x) = \sqrt{x-1} \rightarrow x \geq 1 \rightarrow x \geq 1$$

برای  $x \geq 1$

به جواب دو دو صفر است.

$$\textcircled{6} \text{ الف) } \frac{x+1}{x-1} = 3 \quad \text{ب) } \frac{x+2}{x-2} = \frac{4}{3} \quad \text{ج) } x=0$$

$$\textcircled{7} \text{ الف) } g(x) = f(x-1) = \int_{-1}^x (1, 1), (0, 1), \left(\frac{1}{2}, 1\right), \left(-\frac{1}{2}, 1\right), \left(\frac{1}{2}, 1\right), \left(-\frac{1}{2}, 1\right)$$

$$\text{ب) } h(x) = f(|x|) = \int_{-1}^{|x|} (1, 1), (-1, 1), (0, 1), \left(\frac{1}{2}, 1\right), \left(-\frac{1}{2}, 1\right)$$

$x-1 = \frac{1}{2}$

$f(x)$

$$\rightarrow x-1 = \frac{1}{2} \rightarrow x = \frac{3}{2}$$