

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

$$1/a + 1 = 1/(a-1) \quad \Rightarrow \quad a = -1 \rightarrow a = -1$$

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

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

$$(3) \quad (2f(x) - 3f(-x) = x^2 - 2) \quad \times 2 \Rightarrow 4f(x) - 6f(-x) = 2x^2 - 4$$

$$(2f(-x) - 3f(x) = x^2 + 2) \quad \times 2 \Rightarrow 4f(-x) - 6f(x) = 2x^2 + 4$$

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

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

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

$$n=-1 \rightarrow 4f(0) = 14 + 2m + 2m-1 \rightarrow f(0) = \frac{13 + 4m}{4}$$

$$\frac{2m-1}{2} = \frac{13 + 4m}{4} \Rightarrow 2m-1 = 13 + 2m \Rightarrow m = -6$$

$$f(0) = \frac{2(-6)-1}{2} = -\frac{13}{2}$$

$$(5) f(-1) + f\left(\frac{1}{-1}\right) = 3 + (-12) = -9 \xrightarrow{\div 3} f(-1) = -9$$

$$(6) f(n) \rightarrow 1-n \geq 0 \rightarrow n \leq 1, g(n) \rightarrow (1-n) \geq 0 \rightarrow n \leq 1$$

برای $n=1$

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

برای $n=0$

$$(7) f(n) \rightarrow n \geq 0, g(n) \rightarrow n \geq 0$$

برای $n=0$

$$(8) f(n) = \left[\sqrt{n} \right] \left[\sqrt{n} \right], g(n) = \sqrt{n-1} \rightarrow n \geq 1 \rightarrow n \geq 1$$

برای $n=1$

به جواب می رسد صفر است.

$$(9) (a) \frac{r+1}{r-1} = 3 \quad (b) \frac{r+1}{r-1} = \frac{r}{r-1} \rightarrow r=0$$

$$(10) f(n) = f(2n-1) = \int_{-1}^1 (1, 1), (0, 0), \left(\frac{1}{2}, \frac{1}{2}\right), \left(-\frac{1}{2}, \frac{1}{2}\right), \left(\frac{1}{2}, -\frac{1}{2}\right), \left(-\frac{1}{2}, -\frac{1}{2}\right)$$

$$(b) h(n) = f(|n|) = f(1, 1), (-1, 1), (0, 0), \left(\frac{1}{2}, -\frac{1}{2}\right), \left(-\frac{1}{2}, -\frac{1}{2}\right)$$

$2n-1 = 1 \rightarrow n = 1$

$2n-1 = 2 \rightarrow n = 1.5$