

$$f(x) = \begin{cases} (a+1)(x+1) & x \geq 1 \\ ra + rx & x \leq 1 \end{cases}$$

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

$$f(a+1) \times v = ra - r + a$$

$$1(a+1)r = ra - r$$

$$1ra = -1r \rightarrow a = -1 \wedge$$

$$f(x) = \frac{A}{\sqrt{x}} + \frac{1}{\sqrt{x}} + r \quad f(r-\sqrt{r}) + f(r+\sqrt{r}) = ?$$

$$A^2 = x + \frac{1}{x} + r \quad \xrightarrow{x=r-\sqrt{r}} \quad r + \sqrt{r} + r - \sqrt{r} + r = 4 \rightarrow A = \sqrt{4}$$

$$\xrightarrow{x=r+\sqrt{r}} \quad r + \sqrt{r} + r + \sqrt{r} + r = 4 \rightarrow A = \sqrt{4}$$

$$f(x) = A + r$$

$$f(r-\sqrt{r}) + f(r+\sqrt{r}) = \sqrt{4} + r + \sqrt{4} + r = \boxed{2\sqrt{4} + 2}$$

$$\begin{aligned} 2f(x) - 2f(-x) &= \varepsilon x^2 - x \\ 2f(-x) - 2f(x) &= \varepsilon x^2 + x \end{aligned} \quad \left. \begin{aligned} 2f(x) - 2f(-x) &= \varepsilon x^2 - x \\ 2f(-x) - 2f(x) &= \varepsilon x^2 + x \end{aligned} \right\} \rightarrow 2f(x) + 2f(-x) = \varepsilon x^2 + x$$

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

$$-2f(x) + 2f(-x) = -\varepsilon x^2 + x$$

$$-2f(x) = \varepsilon x^2 + x$$

$$\boxed{f(x) = -\frac{\varepsilon x^2}{2} - \frac{x}{2}}$$

$$(x+r)f(x) - rx f(x+r) = rx^r - mx + rm - 1 \quad \rightarrow \text{✓}$$

$$x=0$$

$$x=-r$$

$$f(0)=?$$

$$rf(0) = rm - 1$$

$$rf(0) = 14 + 20m - 1$$

$$\rightarrow rf(0) = 9m - 1$$

$$14 + 20m - 1 = 9m - 1$$

$$14 = 9m \rightarrow m = \frac{14}{9}$$

$$f(0) = \frac{r}{c} m - \frac{1}{r} \rightarrow f(0) = \frac{r}{c} \times \frac{14}{9} - \frac{1}{r} = \frac{22}{9} = \textcircled{15}$$

$$f(x) + f\left(\frac{1}{x}\right) = \frac{rx^r - 14x + r}{x} \quad f(-1) = ? \quad \rightarrow \text{✓}$$

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$$rf(-1) = \frac{r + 14 + r}{-1} \rightarrow rf(-1) = -14 \rightarrow f(-1) = \textcircled{-9}$$

$$a(x) + b + a\left(\frac{1}{x}\right) + b = rx - 14 + r\left(\frac{1}{x}\right) \rightarrow \begin{matrix} a=r \\ b=-9 \end{matrix} \quad \begin{matrix} y = rx - 14 \\ y = -r - 14 = -9 \end{matrix} \quad \rightarrow \text{✓}$$

$$\begin{cases} f(x) = (x-1)\sqrt{1-x} & x \leq 1 & (-\infty, 1] & f(-1) = -2\sqrt{2} \quad \rightarrow \text{✓} \\ g(x) = -\sqrt{(1-x)^3} & x \leq 1 & (-\infty, 1] & f(-1) = -2\sqrt{2} \quad \checkmark \end{cases}$$

$$f(x) = x\sqrt{x} \quad D_f = [0, \infty) \quad f(1) = 1\sqrt{1} \quad \rightarrow \text{✓}$$

$$g(x) = \sqrt{x^3} \quad x^3 \geq 0 \rightarrow x \geq 0 \quad f(1) = 1\sqrt{1} = 1\sqrt{1} \quad \checkmark$$

$\hookrightarrow \sqrt{x^3 x} = |x| \sqrt{x}$

$$F(x) = \left[\sqrt{x} - \left[\sqrt{x} \right] \right] = 0 \quad \rightarrow \text{✓}$$

$$g(x) = \sqrt{x-m} \quad \begin{matrix} x < 0 \rightarrow x \text{ غير معرف} \\ x \geq 0 \rightarrow 0 \end{matrix} \quad \checkmark$$

$$\text{د) } \frac{f(1) + g(1)}{f(1) - g(1)} = \frac{2 + 1}{2 - 1} = 3$$

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$$\text{ب) } \frac{f(2) + g(2)}{f(2) - g(2)} = \frac{2 + 2}{2 - 2} \rightarrow \text{تعیین نشده}$$

$$\text{ج) } f(0) \times g(-1) = 0$$

$$\text{د) } g(x) = \left\{ (1, 1), (0, 4), \left(\frac{1}{2}, 4\right), \left(-\frac{1}{2}, 2\right), \left(\frac{2}{3}, -1\right) \right\} \quad \text{ب}$$

دوایه های اول ± 2 و ± 1

$$\text{ب) } h(x) = f(x) \quad \begin{array}{l} \frac{-5}{2} > 2 \\ |x| = 2 \end{array} \quad \begin{array}{l} |x| \neq -1 \\ |x| = 0 \\ \downarrow \\ 0 \end{array} \quad \begin{array}{l} |x| \neq -2 \\ |x| = 2 \\ \downarrow \\ \pm 2 \end{array}$$

$$h(x) = \left\{ (2, 1), (-2, 1), (0, 4), (2, -1), (-2, -1) \right\}$$