

$$f(x) = \begin{cases} 2x-1 & ; [x] > 1 \rightarrow x > 2 \\ \varepsilon x + c & ; [x] < 1 \rightarrow x < 2 \end{cases} \Rightarrow f(x) = \begin{cases} 2x-1 & x > 2 \\ \varepsilon x + c & x < 2 \end{cases}$$

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$$\Rightarrow y = \begin{cases} \sqrt{(2x-1)-x+1} & x > 2 \\ \sqrt{(\varepsilon x + c)-x+1} & x < 2 \end{cases} \Rightarrow \begin{cases} \sqrt{x} & x > 2 \\ \sqrt{\varepsilon x + c} & x < 2 \end{cases} \Rightarrow \begin{cases} \sqrt{x} & x > 2 \\ \sqrt{\varepsilon x + c} & x < 2 \end{cases} \Rightarrow -\frac{\varepsilon}{c} x < 2$$

$$\Rightarrow D_y = \left[-\frac{\varepsilon}{c}, +\infty\right)$$

$$y = \frac{3(1x^3 + 12x^2 + 4x + 1)}{(2x+1)^2} = \frac{3(2x+1)^3}{(2x+1)^2} = \frac{3}{2x+1} \Rightarrow D_y = \mathbb{R} - \left\{-\frac{1}{2}\right\}$$

$\hookrightarrow 2x+1 \neq 0 \Rightarrow x \neq -\frac{1}{2}$

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$$f(x) = \begin{cases} \frac{x^2 + 2x - x - 2}{x^2 - 1} = \frac{x^2(x+2) - 1(x+2)}{x^2 - 1} = \frac{(x+2)(x-1)}{x^2 - 1} = x+2 \\ \frac{ax+b}{x+c} \end{cases} \quad \begin{matrix} x \neq \pm 1 \\ x \neq -1 \end{matrix}$$

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$$x+c = x+2 \Rightarrow c=2 \quad \leftarrow \text{تابع } f \text{ در } x \text{ برابرند} \Rightarrow \text{تابع}$$

$$\begin{aligned} g(x) = f(x) &\stackrel{x=1}{\Rightarrow} g(1) = f(1) \Rightarrow 1+2 = \frac{a+2}{b+1} \Rightarrow 3b+3 = a+2 \\ &\stackrel{x=-1}{\Rightarrow} g(-1) = f(-1) \Rightarrow (-1)+2 = \frac{-a+2}{b-1} \Rightarrow b-1 = -a+2 \end{aligned} \Rightarrow \begin{cases} 3b-a = -1 \\ b+a = 3 \end{cases} \Rightarrow \begin{cases} b=2 \\ a=1 \end{cases}$$

$b+a=3 \Rightarrow a=1, b=2$

$$\begin{aligned} g(x) &= \frac{x^2-1}{x^2+ax+b} \\ f(x) &= \frac{x+1}{x-c} = \frac{x^2-1}{x^2-(c+1)x+c} \end{aligned} \Rightarrow \begin{cases} f(x) \cdot g(x) \\ x^2+ax+b = x^2-(c+1)x+c \Rightarrow b=c \\ a = -c-1 \end{cases}$$

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$$f(x) = g(x) \Rightarrow Df = Dg \Rightarrow Dg = \mathbb{R} - c \Rightarrow g(x) = \frac{x^2-1}{(x-c)^2} \Rightarrow \text{دامنه به صورت } \mathbb{R} - c$$

$$\Rightarrow x^2+ax+b = x^2-2cx+c \Rightarrow \begin{cases} a = -2c \\ b = c \end{cases} \quad -c-1 = -2c \Rightarrow \begin{cases} c=1 \\ b=1 \\ a=-2 \end{cases} \quad a+b+c = -2+1+1 = 0$$

$$f(x+1) = (x+2)^2(x) = (x^2+\varepsilon x+\varepsilon)(x) = x^2-\varepsilon x^2+\varepsilon x$$

$$f(1-x) = (-x-2)^2(-x) = (x^2+\varepsilon x+\varepsilon)(-x) = -x^2-\varepsilon x^2-\varepsilon x$$

$$g(x) = -1x^2$$

$$g(x) = x^2 - \varepsilon x^2 + \varepsilon x - x^2 - \varepsilon x^2 - \varepsilon x = -1x^2$$

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$$f(1-x) = \begin{cases} \sqrt{x} + 2 & x \in \cdot \\ \varepsilon \sqrt{x} & x \in \cdot \end{cases}$$

(2) -9

$$x \neq 1 \Rightarrow f(-1) = \varepsilon \sqrt{x} \Rightarrow f(1) + f(-1) = 1 + \varepsilon = 1$$

$$f(x + \sqrt{x}) = x^{\frac{1}{2}} + \varepsilon x \Rightarrow f(4) = \frac{1}{2} + \varepsilon \cdot 4 = 1.8$$

(2) -V

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

(2) -A

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

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

$$\forall f, g = \{(1, K)\} \Rightarrow D_{f \cap g} = 1$$

(2) -9

$$\left. \begin{aligned} Df: x \geq \frac{1}{\varepsilon} a \Rightarrow Df = [\frac{1}{\varepsilon} a, +\infty) \\ Dg: x \leq \frac{b}{\varepsilon} \Rightarrow Dg = (-\infty, \frac{b}{\varepsilon}] \end{aligned} \right\} \Rightarrow \frac{1}{\varepsilon} a = \frac{b}{\varepsilon} = 1 \Rightarrow b = \varepsilon$$

$$\Rightarrow \left\{ \begin{aligned} f(1) = K-1 \Rightarrow \forall f(1) = \forall K-1 \\ g(1) = \forall K \end{aligned} \right\} \Rightarrow \forall f(1) - g(1) = \forall K-1 - \forall K = -K-1$$

$$-K-1 = K \Rightarrow \forall K = -1 \Rightarrow K = -1$$

$$\forall a - \frac{b}{\varepsilon} - K = \forall (\frac{1}{\varepsilon}) - \frac{1}{\varepsilon} - (-1) = 1 - 1 + 1 = 1$$

$$D_{f \times g} = D_g \cap D_f = [-1, \forall]$$

(2) -1

$$Df = x \leq m \Rightarrow Df = (-\infty, m]$$

$$\Rightarrow [-1, m] = [-1, \forall]$$

$$Dg = x \geq -1 \Rightarrow Dg = [-1, +\infty)$$

$$\Rightarrow m = \forall \Rightarrow f(x) = \sqrt{\forall-x} + n$$

$$f - g(c) = f(\forall) - g(\forall) = 9\sqrt{\forall}$$

$$g(c) = \sqrt{9 \cdot \forall} = \sqrt{18} = 3\sqrt{2}$$

$$f(c) = \sqrt{\forall-c} + n = \forall + n$$

$$\Rightarrow n + \forall - 3\sqrt{2} = 9\sqrt{2} \Rightarrow n + \forall = 12\sqrt{2} \Rightarrow n = 12\sqrt{2} - \forall$$

$$n + m = 12\sqrt{2} - \forall + \forall = 12\sqrt{2}$$