

$$f(a) - a + 1 \geq 0$$

$$f(a) = \begin{cases} 2a-1; [a] > \frac{1}{2} \rightarrow a > \frac{1}{2} \\ 4a+3; [a] \leq \frac{1}{2} \rightarrow a < \frac{1}{2} \end{cases}$$

$$\left. \begin{aligned} a > \frac{1}{2} &\rightarrow 2a-1-a+1 \geq 0 \rightarrow a \geq 0 \xrightarrow{\text{اشتقاق}} [\frac{1}{2}, +\infty) \\ a < \frac{1}{2} &\rightarrow 4a+3-a+1 \geq 0 \rightarrow 3a+4 \geq 0 \rightarrow a \geq -\frac{4}{3} \xrightarrow{\text{اشتقاق}} [-\frac{4}{3}, \frac{1}{2}) \end{aligned} \right\} \xrightarrow{\text{اجتماع}} [-\frac{4}{3}, +\infty)$$

-2-

$$\frac{24a^3 + 34a^2 + 18a + 3}{(4a^2 + 4a + 1)^2}$$

$$\text{مخرج: } 3(12a^3 + 12a^2 + 4a + 1)$$

$$\text{مخرج: } \frac{(4a^2 + 4a + 1)^2}{(2a+1)^2} = (2a+1)^2$$

$$\frac{3(2a+1)^3}{(2a+1)^4} = \frac{3}{2a+1}$$

$$\text{دامنه} \rightarrow (4a^2 + 4a + 1)^2 = 0 \rightarrow (2a+1)^2 = 0 \rightarrow a = -\frac{1}{2} \rightarrow D = \mathbb{R} - \{-\frac{1}{2}\}$$

$$f(a) = \begin{cases} \frac{2^3 + 2a^2 - a - 2}{a^2 - 1}; & a \neq \pm 1 \\ \frac{a+2}{a+1}; & a = \pm 1 \end{cases}$$

$$\text{۳- چون } f(a) = g(a) \text{ در واقع } f \text{ بی‌سسته است.}$$

$$\frac{2^3 + 2a^2 - a - 2}{(a-1)(a+1)} \rightarrow \frac{2^2(a+2) - (a+2)}{(a-1)(a+1)} \rightarrow \frac{(a+2)(2-1)}{(a-1)(a+1)} \left\{ \begin{aligned} & a+2; a \neq \pm 1 \\ & \end{aligned} \right.$$

رفتار تابع در نزدیکی

نقاط تعریف نشده مشابه

یعنی $a+2$

$$\left\{ \begin{aligned} \lim_{a \rightarrow 1} f(a) &= 1+2=3 \\ \lim_{a \rightarrow -1} f(a) &= -1+2=1 \end{aligned} \right.$$

$$\frac{a+2}{a+1} \xrightarrow{a=1} \frac{a+2}{1+b} = 3 \rightarrow a+2 = 3+3b \rightarrow 3-b+2 = 3+3b \rightarrow 4b = 2, b = \frac{1}{2} \rightarrow a = \frac{1}{2}$$

$$\xrightarrow{a=-1} \frac{-a+2}{b-1} = 1 \rightarrow -a+2 = b-1 \rightarrow a = 3-b$$

$$g(a) = f(a) \rightarrow g(a) = a+2 \rightarrow c=2$$

$$b+c = \frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$$

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

- ۳

$$g(x) = \frac{x^2-1}{x^2+ax+b} \rightarrow \frac{(x-1)(x+1)}{(x-1)(x+c)} \rightarrow x^2+ax+b = \underbrace{(x-1)(x+c)}$$

$$x^2-x+cx-c = x^2-(c+1)x+c$$

$$x^2+ax+b = x^2-(c+1)x+c$$

$$b=c, -c-1=a$$

$$a+b+c = -c-1+c+c = c-1$$

- ۴

$$f(x) = (x-3)^2(x-1)$$

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

$$f(x+1) = (x+1-3)^2(x+1-1) = (x-2)^2x = (x^2-4x+4)x = x^3-4x^2+4x$$

$$f(1-x) = (1-x-3)^2(1-x-1) = (-x-2)^2(-x) = (x^2+4x+4)(-x) = -x^3-4x^2-4x$$

$$g(x) = x^3-4x^2+4x - x^3-4x^2-4x = -8x^2$$

- ۵

$$f(1-2x) = \begin{cases} \sqrt[3]{2x} + 2 & x \leq 0 \\ \sqrt[3]{2x} & x > 0 \end{cases}$$

$$1-2x = -1 \rightarrow 2x = 2 \rightarrow x = 1$$

$$1-2x = 3 \rightarrow 2x = -2 \rightarrow x = -1$$

$$\left. \begin{aligned} f(2) &= \sqrt[3]{-1} + 2 = 1 \\ f(-1) &= \sqrt[3]{1} = 1 \end{aligned} \right\} \xrightarrow{1+2} \boxed{3}$$

$$x+\sqrt{x} = 4 \rightarrow x=9$$

$$f(4) = \underbrace{f^{\frac{1}{4}}}_{\frac{1}{4}} + \underbrace{f^{\frac{3}{4}}}_{\frac{3}{4}} = \boxed{1}$$

- ۶

$$f(x) = x^3 + x$$

$$f(x-1) = (x-1)^3 + x-1 = x^3 - 3x^2 + 3x - 1 + x - 1 = x^3 - 3x^2 + 4x - 2$$

$$f(1-x) = (1-x)^3 + 1-x = 1 - 3x + 3x^2 - x^3 + 1 - x = -x^3 + 3x^2 - 4x + 2$$

$$f(x) = \sqrt{c-x} + k - 1$$

$$g(x) = \sqrt{b-x} + 3k$$

$$f-g = \{(1, k)\}$$

$$3a - \frac{b}{r} = k$$

$$c - 3a = 0 \rightarrow c = 3a \rightarrow a = \frac{c}{3}$$

$$b - c = 0 \rightarrow b = c \rightarrow 3k + r = 0 \rightarrow 3k = -r \rightarrow k = -\frac{r}{3}$$

$$3 \times \frac{c}{3} - \frac{c}{r} + 1 = c - r + 1 = 0$$

$$f(1) = \sqrt{c-3a} + k - 1$$

$$g(1) = \sqrt{b-r} + 3k$$

$$f(1) - g(1) = \sqrt{c-3a} + k - 1 - \sqrt{b-r} - 3k = k$$

$$\sqrt{c-3a} + k - r - \sqrt{b-r} - 3k = k$$

$$\sqrt{c-3a} - \sqrt{b-r} = \frac{r(k+r)}{r(k+1)}$$

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

$$g(x) = \sqrt{x} + r$$

$$D_{f \cap g} = [-1, \sqrt{3}]$$

$$f-g(x) = 4\sqrt{3}$$

$$D_f \cap D_g = [-1, \sqrt{3}]$$

$$D_g \Rightarrow x+r \geq 0 \rightarrow x \geq -r \rightarrow x \geq -1 \rightarrow [-1, +\infty)$$

$$D_f \Rightarrow m-x \geq 0 \rightarrow m \geq x \rightarrow (-\infty, m]$$

$$m = \sqrt{3} \leftarrow [-1, m] = \text{استدلال}$$

$$\sqrt{m-x} + n = 4\sqrt{3} \rightarrow x+n = 4\sqrt{3} \rightarrow n = 4\sqrt{3} - x$$

$$m+n = \sqrt{3} + 4\sqrt{3} - x = 5\sqrt{3} - x$$