

نقد و بررسی

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

$$f(x) = \begin{cases} x-1 & [x] \geq 1 \\ x+1 & [x] \leq 0 \end{cases} \Rightarrow [x] \geq 0 \Rightarrow x \geq 0 \Rightarrow x \geq 1$$

$$\begin{aligned} & \text{for } x < 0 \\ & f(x) + 1 - x + 1 = x + 2 \geq 0 \\ & \boxed{x \geq -2} \\ & \text{for } x \geq 0 \\ & x - 1 - x + 1 = 0 \end{aligned}$$

$$D_f = [-2, +\infty)$$

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تابع درجه دوم

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

$$D = \mathbb{R}$$

$$D_f = \mathbb{R} - \left\{ \frac{1}{x} \right\} = \mathbb{R} - \left\{ \frac{1}{x} \right\}$$

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

$$g(x) = x + c$$

$$g(x) = f(x)$$

$$D_f = D_g$$

$$\begin{aligned} b + c &= ? \\ c + \frac{1}{b} &= \frac{a}{b} \\ c &= \frac{a}{b} - \frac{1}{b} \end{aligned}$$

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$$x \neq \pm 1 \Rightarrow x + 2 = x + c \Rightarrow \boxed{c = 2}$$

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

$$\Rightarrow b - 1 = 2 - (2b + 3) \Rightarrow b - 1 = 2 - 2b - 3 \Rightarrow b - 1 = -2b - 1 \Rightarrow 3b = 0 \Rightarrow \boxed{b = 0}$$

$$\Rightarrow 2b = 2 \Rightarrow \boxed{b = 1}$$

$$f(x) + g(x)$$

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

$$c=1$$

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

مشتق 2، 3

$$Df = Dg$$

$$(x-c)^2 = x^2 - 2cx + c^2 = x^2 - 2cx + b \Rightarrow \begin{cases} a = -2c \\ b = c^2 \end{cases}$$

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

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

$$\begin{cases} (x-1)^2 = x^2 - 2x + 1 \\ x^2+ax+b \end{cases} \Rightarrow \begin{cases} b=1 \\ a=-2 \end{cases} \Rightarrow b=c^2=1 \Rightarrow c=\pm 1$$

$$a+b+c = -2+1+1 = 0$$

$$\Rightarrow c=1$$

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

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

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

$$\begin{aligned} &= x(x-1)^2 + (x+1)^2(-x) \\ &= x(x^2-2x+1) + (x^2+2x+1)(-x) \\ &= x^3 - 2x^2 + x - x^3 - 2x^2 - x - 1 \\ &= -4x^2 - 1 \end{aligned}$$

$$\begin{aligned} f(1-x) &= (1-x-2)^2(1-x-1) = (x+1)^2(-x) \\ &= \frac{(-x-1)^2(-x)}{(x+1)^2(-x)} \end{aligned}$$

$$f(x) = \begin{cases} \sqrt{x} + x & x \leq 0 \\ \sqrt{x} & x > 0 \end{cases}$$

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

$$f(x) = \sqrt{x} + x$$

$$f(x) \Rightarrow 1-2x = 2 \Rightarrow 2x = -1 \Rightarrow x = -1/2 \Rightarrow f(x) = \sqrt{-1/2} + (-1/2) = 1$$

$$f(-1) \Rightarrow 1-2x = -1 \Rightarrow 2x = 2 \Rightarrow x = 1 \Rightarrow f(-1) = \sqrt{1} = 1$$

به نام خداوند دانش

$$f(x + \sqrt{x}) = x^2 + 3x = (x)^2 + 3(x) - 2\sqrt{x} + 1 = \boxed{241}$$

$\frac{1}{2}$

$$f(y) \Rightarrow y + \sqrt{y} = 4 \Rightarrow y = 1$$

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$$f(x) = x^2 + x \Rightarrow f(\overbrace{x-1}^+)+f(\overbrace{1-x}^-)=0$$

$$\Rightarrow f^2 + t - t^2 - t = 0$$

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

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

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2. b. h. f. n.

$$D_g: b - \varepsilon \geq 1 \Rightarrow \frac{b}{\varepsilon} \geq \frac{1}{\varepsilon}$$

$$D_f: \varepsilon - \frac{1}{a} \geq 0 \Rightarrow \varepsilon \geq \frac{1}{a}$$

$$D_f \cap D_g = 1$$

$$\Rightarrow \frac{b}{\varepsilon} = 1 \Rightarrow \boxed{b = \varepsilon} \quad , \quad \frac{1}{a} = 1 \Rightarrow \boxed{a = \frac{1}{1}}$$

$$1 - \frac{b}{\varepsilon} - k = 1 - \frac{\varepsilon}{\varepsilon} - k = 1 - 1 - k = -k = \boxed{1} \quad \text{(circled)}$$

$$f(\infty): \sqrt{1 - \varepsilon + k - 1} \Rightarrow \boxed{f(1) = k - 1} \Rightarrow 1 - g = 1 - k - 1 - k = \boxed{-k - 1} = k$$

$$g(\infty): \sqrt{1 - \varepsilon + k} \Rightarrow g(1) = k$$

$$\Rightarrow \boxed{\begin{matrix} k = -1 \\ k = -1 \end{matrix}}$$

المعادلة

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$$Df \cap Dg = [-1, 1] \quad Dg = \{x + 1 \mid x \in \mathbb{R}\} = \boxed{[0, 2]} \Rightarrow Df = \boxed{[-1, 1]}$$

$$Df: m - 1 \leq 1 \Rightarrow m \leq 2 = \boxed{m = 1}$$

$$f(x): \sqrt{1-x} + 1 = \sqrt{1-0} + 1 = \boxed{2}$$

$$g(x): \sqrt{x} + 1 = \sqrt{1} + 1 = 2$$

$$m + n = 1 + 1 = 2 = \boxed{2}$$

$$f - g = 2 - 1 = 1$$

$$n = 1$$