

$$y = \sqrt{x^3 f(x+1)} = \sqrt{x^3 \left(\left(\frac{1}{x} \right)^{x-1} - 1 \right)} \geq 0 \Rightarrow \left(\frac{1}{x} \right)^{x-1} - 1 \geq 0$$

$$x < 1 \text{ (1)} \text{ و } x^3 \geq 0 \text{ (2)} \xrightarrow{(1) \text{ و } (2)} D_f = [0, 1]$$

$$f(-x) = \sqrt{-x + |-x + 2|} = \sqrt{-x + |x - 2|} \geq 0$$

غیر مجاز $\xrightarrow{x \geq 2} |x - 2| = x - 2 \Rightarrow -x + (x - 2) = -2 < 0 \rightarrow$

$\xrightarrow{x < 2} |x - 2| = 2 - x \Rightarrow -x + (2 - x) = 2 - 2x \geq 0 \Rightarrow x \leq 1$

$$D_f = (-\infty, 1]$$

$$y = \sqrt{\frac{x-1}{f(x)}} \Rightarrow \frac{x-1}{f(x)} \geq 0 \text{ و } f(x) \neq 0 \Rightarrow x \neq -4 \text{ و } 2 \text{ و } 3 \rightarrow$$

(1) $\frac{-4}{+} \mid \frac{2}{-} \mid \frac{3}{+}$

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

$\Rightarrow D_f = (2, 3) \cup (-4, 1]$

$$D_{y_1} = D_{y_2} \Rightarrow 9x^4 - 7x^2 - 4x - 3 = (3x^2 + x + 1)(3x^2 - x - 3)$$

نقاط مسایبی صفر شوند

باید بانی از آنها برابر باشد $\Rightarrow 3x^2 + x + 1 \Rightarrow \sqrt{-(a+b)} = \sqrt{-2x}$

$\Rightarrow 3x^2 - x - 3 \Rightarrow \sqrt{-(a+b)} = \sqrt{4} = 2$

$$f(x) - f\left(\frac{1}{x}\right) = x^3 + x - \left(\frac{1}{x^3} + \frac{1}{x}\right) = \frac{x^6 + x^4 - 1 - x^2}{x^3} = \frac{(x^2 - 1)(x^2 + 1)(x^2 + x + 1)}{x^3}$$

$x^4 + 5x^2 + 14$ (مشتق دوم)

$x \neq 0$ و $\frac{-}{+} \mid \frac{+}{-} \mid \frac{+}{+} \Rightarrow D_f = [-2, 0) \cup [2, +\infty)$

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

$$f(10) = f(2^3 + 2) \Rightarrow f(10) = 2(2)^2 - 1 = 7$$

$$f(2) + f(10) = 1 + 7 = 8$$

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$$f(x) = x^3 - 4x^2 + 12x \Rightarrow (x-2)^3 + 1$$

$$g(x) = x^3 + 9x^2 + 12x = (x+3)^3 - 27$$

$$g(\sqrt[3]{27} - 3) = (\sqrt[3]{27} - 3 + 3)^3 - 27 = -27 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \frac{-27}{10} = \boxed{-2.7}$$

$$f(\sqrt[3]{27} + 2) = (\sqrt[3]{27} + 2 - 2)^3 + 1 = 1$$

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$$f(x) + g(x) = \sqrt{x+4}\sqrt{x-4} + \sqrt{x-4}\sqrt{x+4} \xrightarrow{\text{بفرض}} t = \sqrt{x-4} \Rightarrow x = t^2 + 4$$

$$\Rightarrow f(x) = \sqrt{(t^2+4)+4}t = \sqrt{(t+2)^2} = t+2 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} f(x) + g(x) = t+2 + |t-2|$$

$$\Rightarrow g(x) = \sqrt{(t^2+4)-4}t = \sqrt{(t-2)^2} = |t-2|$$

$$t \geq 2 \Rightarrow t+2+t-2=2t=2\sqrt{x-4} \Rightarrow a+b=2, c=4 \Rightarrow \frac{2}{4} = \boxed{\frac{1}{2}}$$

$$t < 2 \Rightarrow t+2-t+2=4 \rightarrow 4 = 4 + 0(\sqrt{x-4}) \quad \times$$

هر مقدار برای هر کد از آن کد است

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$$x=2 \Rightarrow g(2)=1, f(2) = \frac{2+2}{(2-1)(2-3)} = -4 \Rightarrow \frac{g}{f} = \frac{-1}{4}$$

$$x=1 \Rightarrow f(1) = \text{تعریف نشده}$$

$$x=3 \Rightarrow f(3) = \text{تعریف نشده}$$

$$x=0 \Rightarrow g(0)=4 \Rightarrow f(x) \Rightarrow f(0) = \frac{0+2}{(0-1)(0-3)} = \frac{2}{3} \Rightarrow \frac{g}{f} = \frac{4}{\frac{2}{3}} = 6$$

$$\frac{g}{f} = \left\{ \left(2, \frac{1}{4} \right), (0, 6) \right\}$$

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$$f(2x) = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), (2, 2), \left(\frac{5}{2}, 4 \right) \right\}$$

$$f(x^2) = \left\{ (\pm 1, 2), (\pm \sqrt{3}, -1), (\pm 2, 2) \right\}$$

$$2g(x)+1 = \left\{ (-2, 9), (1, 3), (3, 9), (-1, 1) \right\}$$

$$\frac{2f}{g} = \left\{ (1, -4), (3, -1) \right\}$$

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