

$$xf(x) = 0$$

$$\Rightarrow \begin{array}{c|ccccc} & -\infty & 0 & 2 & \infty \\ \hline x & - & - & 0 & + & + \\ f(x) & + & 0 & - & - & + \\ \hline y = \sqrt{xf(x)} & - & 0 & 0 & 0 & - \end{array} \Rightarrow D_f = [-\infty, 0] \cup [2, \infty]$$

$$y = \sqrt{xf(x)}$$

$$\frac{-x}{f(x)} = 0 \Rightarrow x = 0, \infty, 2, -2$$

$$\begin{array}{c|ccccc} & -\infty & 0 & 2 & \infty \\ \hline -x & + & + & 0 & - & - \\ f(x) & - & 0 & + & - & 0 \\ \hline y = \sqrt{\frac{-x}{f(x)}} & - & 0 & + & 0 & - \end{array} \Rightarrow D_f = (-2, 2)$$

شامل ۴ عدد صحیح می باشد
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$$y = \sqrt{\frac{-x}{f(x)}}$$

$$f(x) - 2f(2) = x^2 - 2x + 1 \xrightarrow{\text{در } x=2} f(2) - 2f(2) = 2 \Rightarrow -f(2) = 2 \Rightarrow f(2) = -2$$

$$\Rightarrow f(x) = x^2 - 2x + 1 + (-2x - 2) \Rightarrow f(x) = x^2 - 4x - 1 \Rightarrow f(-2) = 4 + 8 - 1 = 11$$

$$f(-2) = \underline{\underline{11}}$$

$$f(f(\infty)) + f(f(1)) = f(2) + f(\infty) = 7 + 2 = 9$$

$$f(1) = \infty$$

$$f(\infty) = \infty - \sqrt{9} = 2$$

$$f(2) = 7$$

$$\left. \begin{array}{l} f(x) = ax^2 - bx + 2 \\ f(x-1) = ax^2 - 2ax + a - b + b + 2 \end{array} \right\} f(x-1) - f(x) = -2ax + a + b$$

$$-2ax + a + b = 2x + 2 \Rightarrow -2a = 2 \Rightarrow a = -1, a + b = 2 \Rightarrow B = \infty \Rightarrow B = \infty, a = -1$$

$$\left. \begin{aligned} (\sqrt{3}-2)^2 &= 3-4\sqrt{3}+4 \\ 4(\sqrt{3}-2) &= 4\sqrt{3}-8 \end{aligned} \right\} \Rightarrow \frac{x^2+4x+5}{x^2+4x+7} = \frac{3-4\sqrt{3}+4\sqrt{3}-4+5}{3-4\sqrt{3}+4\sqrt{3}-4+7} = \frac{4}{6}$$

$$f(\sqrt{3}-2) = \frac{4}{6} = \frac{2}{3}$$

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$$\left(x - \frac{1}{x}\right)^2 = \frac{x^4+1}{x^2} - 2 \Rightarrow \text{if } f\left(x - \frac{1}{x}\right) = \frac{x^4+1}{x^2} \Rightarrow \text{تابع با عدد ۲ متجانس است}$$

۲ واحد اضافه می کند

$$\Rightarrow f(-3) = (-3)^2 + 2 = 11$$

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$$g(x) = \sqrt{9-x^2} \Rightarrow x^2 \leq 9 \Rightarrow x \leq 3, x \geq -3 \Rightarrow D_g = [-3, 3]$$

مقادیر ممکن: ۳, ۲, ۱, ۰ و ۰, ۱, ۲, ۳

رنگین: ۰, ۱, ۲, ۳

$$f(x) = \{(2, 0), (1, -4), (0, 2), (3, 1)\}$$

$$\text{الف) } \frac{f}{g} = \{(2, 0), (1, \frac{2}{\sqrt{5}}), (0, \frac{3}{4})\}$$

$$\text{ب) } \frac{g}{f} = \{(2, \frac{3}{2}), (1, \frac{\sqrt{2}}{1}), (0, \frac{2}{3})\}$$

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$$\text{الف) } 2f(x) = \{(2, 2), (3, 8), (-\infty, 4), (1, -4)\}$$

$$\text{ج) } f(x+1) = \{(2, 2), (3, 5), (-\infty, 3), (1, -1)\}$$

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$$\text{ب) } 3f^2(x+1) = \{(2, 2), (3, 49), (-\infty, 13), (1, 13)\}$$

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

$$\text{الف) } f-g = \{(1, 4), (2, 2), (3, 0)\}$$

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$$\text{ب) } \frac{2f}{g} = \{(1, 3), (2, 6), (3, -2)\}$$

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