

$$x \in \mathbb{R} \rightarrow -\omega, 2, \omega$$

$$D_f = [-\omega, 0] \cup [2, \omega]$$

$$x < -\omega, f(x) > 0 \\ -\omega < x < 2, f(x) < 0 \\ 2 < x < \omega, f(x) > 0$$

(۵)

$$x < 0, f > 0 \Rightarrow x f < 0. \quad \times$$

$$x = -\omega \rightarrow \text{حاصل صفر} \checkmark$$

$$x > 0, f < 0 \Rightarrow x f < 0 \rightarrow 0 < x < 2 \quad \times$$

$$x > 0, f < 0 \Rightarrow x f < 0 \quad \times$$

$$x = 2 \checkmark$$

$$x > 0, f > 0 \Rightarrow x f > 0 \rightarrow 2 < x < \omega \checkmark$$

$$x = \omega \rightarrow \text{حاصل صفر} \checkmark$$

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$$\frac{-x}{f(x)} \neq 0, f(x) \neq 0$$

$$x \in \mathbb{R} \rightarrow x = -3, 2, \omega$$

$$x < -3, f(x) < 0$$

$$-3 < x < 2, f(x) < 0$$

$$2 < x < \omega, f(x) > 0 \checkmark$$

~~برای ۲ عدد صحیح است~~

(۵,۵)

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$$x = -3, f(-3) = 0 \rightarrow \text{صفر}$$

$$-3 < x < 0 \rightarrow \text{صفر} \rightarrow \times$$

$$x = 0 \rightarrow \text{صفر} \rightarrow \times$$

$$0 < x < 2 \rightarrow \text{صفر} \rightarrow \times$$

$$f(2) = 0, x = 2 \rightarrow \text{صفر} \times$$

$$2 < x < \omega, f > 0 \rightarrow -x < 0 \rightarrow \text{صفر} \times$$

$$0 < x < 2 \rightarrow x > 0, f < 0 \rightarrow \text{صفر} \rightarrow x = 1 \quad x = 0 \checkmark$$

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$$f(2) - 2f(2) = 4 - 4 = 0$$

$$-f(2) = 2 \rightarrow f(2) = -2$$

(۵,۵)

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$$f(1) \rightarrow 1 \leq x \rightarrow f(1) = 2 + 4 = 6$$

$$f(f(1)) = f(6) \rightarrow \omega > 3 \quad f(6) = 6 - \sqrt{6+2} = 6 - 3 = 3$$

$$f(2) = 2 \times 2 + 4 = 8 \rightarrow 2 \leq x \rightarrow f(f(6)) = f(3)$$

$$f(f(1)) + f(f(6)) = f(6) + f(3) = 3 + 7 = 10$$

(۵)

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$$f(x-1) = a(x-1)^2 - b(x-1) + 7 = a(x^2 - 2x + 1) - bx + b + 7 = ax^2 - 2ax + a - bx + b + 7$$

$$f(x-1) - f(x) = (ax^2 - 2ax + a - bx + b + 7) - (ax^2 - bx + 7) = -2ax + a + b$$

$$-2ax + (a+b) = 4x + 7 \rightarrow -2a = 4 \rightarrow a = -2, b = 5$$

$$a - b = -2 - 5 = -7$$

(۵)

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$$f(\sqrt{x}-2) = \frac{1-\cancel{f\sqrt{x}}+f\sqrt{x}-1+5}{1-\cancel{f\sqrt{x}}+\cancel{f\sqrt{x}}-1+1} = \frac{4}{1} = \frac{4}{1}$$

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$$\frac{a^{\frac{1}{n}}}{a^{\frac{1}{n}}} = \frac{a^{\frac{1}{n}}}{a^{\frac{1}{n}}} + \frac{1}{a^{\frac{1}{n}}} = a^{\frac{1}{n}} + \frac{1}{a^{\frac{1}{n}}}$$

$$f\left(a - \frac{1}{a}\right) = a^2 + \frac{1}{a^2} \rightarrow \left(a - \frac{1}{a}\right)^2 = a^2 + \frac{1}{a^2} + 2$$

$$a - \frac{1}{a} = -3 \rightarrow a^2 + \frac{1}{a^2} = 9 + 2 = 11$$

1, 5

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$$\rightarrow \frac{f(1)}{g(1)} = \frac{-4}{\sqrt{2}} = -2\sqrt{2} \quad \frac{f(2)}{g(2)} = 0 \quad \frac{f(0)}{g(0)} = \frac{2}{3}$$

$$\left\{ -2\sqrt{2}, 0, \frac{2}{3} \right\}$$

$$\frac{g}{f} \Rightarrow \frac{g(1)}{f(1)} = \frac{2}{-4} = -\frac{1}{2}, \quad \frac{g(2)}{f(2)} = \frac{\sqrt{2}}{0} = -\frac{\sqrt{2}}{0}$$

$$g(2) = \sqrt{4-2} = \sqrt{2}$$

$$g(1) = \sqrt{4-1} = \sqrt{3}$$

$$g(0) = \sqrt{4} = 2$$

$$g(1) \rightarrow \text{تلفیق}$$

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فقط مولفه دوم نوشته شده - باید به صورت مجموعه ای از زوج های مرتب نوشته شود

$$الف) f(a) = \{(2,2), (2,1), (-5,4), (1,-4)\}$$

$$ب) f(a)+1 = \{(2,3), (2,2), (-5,5), (1,-3)\}$$

$$ج) f^2(a)+1 = \{(2,4), (2,5), (-5,14), (1,13)\}$$

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

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$$الف) = \{(2,2), (2,2), (2,2)\}$$

1, 2, 5

ب)

$$\frac{2}{3} = \{(2,2), (2,2)\}$$

$$f-0=2 \leftarrow g(1)=0, f(1)=4 \leftarrow a=1 \text{ برای}$$

$$f-1=2 \leftarrow g(2)=1, f(2)=3 \leftarrow a=2 \text{ برای}$$

$$1-(-1)=2 \leftarrow g(3)=-1, f(3)=1 \leftarrow a=3 \text{ برای}$$

$$f-0=2 \leftarrow g(1)=0, f(1)=4 \leftarrow a=1 \text{ برای}$$

$$\frac{2}{1} = \frac{f(1)}{g(1)} \leftarrow a=2 \text{ برای}$$

$$-1 = \frac{1}{-1} = \frac{f(3)}{g(3)} \leftarrow a=3 \text{ برای}$$

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