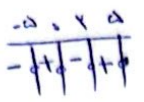
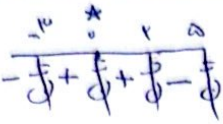


$x f(x) \geq 0$  $D_f = [-5, 0] \cup [2, 5]$	۱
$\frac{-x}{f(x)} \geq 0$  $D_f = (-3, 1) \cup (2, 5)$ ۳ عدد صحیح در این بازه موجود است	۲
$x=2 \rightarrow f(2) - 2f(2) = 4 - 4 + 4 = 4 - f(2) = 2 \rightarrow f(2) = -2$ $x=-2 \rightarrow f(-2) - 2f(2) = 4 + 4 + 4 = 12 - 2f(2) = 12 - 2(-2) = 16 \rightarrow f(-2) = 8$	۳
$f(5) \rightarrow x > 2 \rightarrow 5 - \sqrt{5+4} = 2$ $f(2) \rightarrow x \leq 2 \rightarrow 2(2) + 3 = 7$ $f(1) \rightarrow x \leq 2 \rightarrow 2(1) + 3 = 5$ $f(5) \rightarrow x > 3 \rightarrow 5 - \sqrt{5+4} = 2$	۴
$f(x-1) - f(x) = 4x+2 \rightarrow x=1 \rightarrow f(0) - f(1) = 6$ $f(0) = a-b+2$ $2 - (a-b+2) = 6$ $-a+b-x = 6$ $a-b = -6$	۵

$$\frac{n^2 + 4n + 4 + 1}{n^2 + 4n + 4 + 3} \rightarrow \frac{(n+2)^2 + 1}{(n+2)^2 + 3} \rightarrow \frac{(\sqrt{3} - 2 + 2)^2 + 1}{(\sqrt{3} - 2 + 2)^2 + 3} = \frac{2+1}{3+3} = \frac{3}{6} = \left(\frac{1}{2}\right)$$

2

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

$$\left(n - \frac{1}{n}\right)^2 = n^2 + \frac{1}{n^2} - 2 \xrightarrow{\text{نوعه اولی}} f\left(n - \frac{1}{n}\right) = \left(n - \frac{1}{n}\right)^2 + 2$$

$$f(n) = n^2 + 2$$

$$f(-3) = 9 + 2 = 11$$

2

$$f(x) = \{(2, 0), (1, -4), (0, 2), (5, 1)\}$$

$$g(x) = \sqrt{4 - x^2} \rightarrow g(x) = \{(2, \sqrt{0}), (1, \sqrt{3}), (0, 2), (\cancel{5}, \cancel{1})\}$$

$$\text{بنابراین } f \circ g = \{(0, \frac{2}{\sqrt{5}}), (1, -\sqrt{2}), (2, 0)\}$$

2

$$\text{بنابراین } f \circ g = \{(0, \frac{2}{\sqrt{5}}), (1, -\frac{\sqrt{2}}{2}), (\cancel{2}, \cancel{0})\}$$

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

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

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

2

$$\text{ج) } x=2 \rightarrow f(2)=1 \rightarrow 3 \times 1^2 + 1 = 4$$

$$x=3 \rightarrow f(3)=4 \rightarrow 3 \times 4^2 + 1 = 49$$

$$x=-2 \rightarrow f(-2)=2 \rightarrow 3 \times 2^2 + 1 = 13$$

$$x=1 \rightarrow f(1)=-2 \rightarrow 3 \times (-2)^2 + 1 = 13$$

$$\Rightarrow f \circ f(x) = \{(2, 4), (3, 49), (-2, 13), (1, 13)\}$$

$$\text{بنابراین } f \circ g = \{(1, 4), (2, 2), (3, 2)\}$$

2

$$\text{بنابراین } f \circ g = \{(2, \frac{2 \times 2}{1}), (3, \frac{1 \times 2}{-1}), (\cancel{1}, \cancel{\frac{2 \times 2}{1}})\} \rightarrow \{(2, 4), (3, -2)\}$$

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