

از ۶ تا ۵ تقریبی شد $\Rightarrow f(x) = [-6, 5]$

$y = \sqrt{x} f(x) \Rightarrow x f(x) \geq 0$

$x > 0 \Rightarrow f(x) \geq 0$
 $x < -6 \Rightarrow f(x) \leq 0$
 $0 \leq x \leq 5 \Rightarrow f(x) \geq 0$
 $x > 5 \Rightarrow f(x) < 0$

$D_f = [-5, 0] \cup [2, 5]$

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

$f(x) = 0 = \{ -3, 0, 5 \}$

$D_f = (-3, 0) \cup (5, \infty)$

اعداد صحیح این: $-2, -1, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100$

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

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

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

$f(x) = \begin{cases} x - \sqrt{x+2} & x > 3 \\ 2x+3 & x \leq 3 \end{cases}$

$f(5) = 5 - \sqrt{5+2} = 2$

$f(f(5)) = f(2) = 2 \times 2 + 3 = 7$

$f(f(5)) + f(f(1)) = 7 + 2 = 9$

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

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

$-2a = 2 \Rightarrow a = -1$

$a + b = 2 \Rightarrow -1 + b = 2 \Rightarrow b = 3$

$a - b = -1 - 3 = -4$

$$f(n) = n^2 - 3n + 1 \Rightarrow f(2) = 4 - 6 + 1 = -1 \quad \left. \begin{array}{l} f(1) = 1 - 3 + 1 = -1 \\ f(-1) = 1 + 3 + 1 = 5 \end{array} \right\} \rightarrow \text{مجموعه } \{ -1, 1, 5 \} \quad \text{جواب}$$

1, 1, 5

$$f'(n) = 2n - 3 \Rightarrow f'(2) = 4 - 3 = 1 \rightarrow \text{مجموعه } \{ 1, 1, 5 \} \Rightarrow \frac{1}{1} = 1 \quad \text{جواب}$$

$$f(n) = \begin{cases} 3n+1 & n > 2 \\ n^2 & n < 2 \end{cases} \Rightarrow \left. \begin{array}{l} f(3) = 3(3)+1 = 10 \\ f(-2) = (-2)^2 = 4 \\ f(2) = 3(2)+1 = 7 \end{array} \right\} \rightarrow \frac{(3 \times 10)(2 \times 4)}{7} = \frac{24}{7} \quad \text{جواب}$$

$$f = \{(2, 4), (4, 2), (1, 1), (1, 4)\} \Rightarrow f(f) = 1$$

$$\frac{f(f(2)) - f(f(4))}{f(1) - 2} = \frac{4 - 2}{4 - 2} = 1 \quad \text{جواب}$$

$$f(n) = \frac{n^2 + f(n) + 9}{n^2 + f(n) + 9} \Rightarrow Z = \sqrt{3} - 2 \Rightarrow Z^2 = (\sqrt{3} - 2)^2 = 3 - 4\sqrt{3} + 4 = 7 - 4\sqrt{3}$$

$$\Rightarrow f(Z) + Z^2 + 9 = (7 - 4\sqrt{3}) + 3(\sqrt{3} - 2) + 9 = 7 - 4\sqrt{3} + 3\sqrt{3} - 6 + 9 = 10 - \sqrt{3}$$

$$f(f(\sqrt{3} - 2)) = \frac{1}{f} \Rightarrow \frac{1}{10 - \sqrt{3}} \Rightarrow \text{مخرج کسر}$$

$$f(2) = \frac{f+1+9}{f+1+9} = \frac{21}{17} \quad \text{جواب}$$

$$f(n) = n^2 + \frac{1}{n^2} \Rightarrow f(\sqrt{n}) = (\sqrt{n})^2 + \frac{1}{(\sqrt{n})^2} = n + \frac{1}{n}$$

$$\Rightarrow f(\sqrt{n}) = n + \frac{1}{n} \Rightarrow f(n) = n^2 + \frac{1}{n^2}$$

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