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پاسخنامه ی نشریه ی کالیف شماره ۷ (نکس انتشاری)

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$$y = \sqrt{x f(x)} \Rightarrow x f(x) \geq 0 \Rightarrow x = -5, x = 2, x = 5 \Rightarrow [-5, 5]$$

$$f(x) \leq 0 \Rightarrow f(x) \geq 0 \Rightarrow [2, 5]$$

$$x f(x) \geq 0 \Rightarrow x < 0 \Rightarrow f(x) < 0 \Rightarrow [-5, 0]$$

$$x = 0 \checkmark (= [2, 5]) \Rightarrow f(x) \geq 0$$

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

-۲

$$y = \sqrt{\frac{-x}{f(x)}} \Rightarrow \frac{-x}{f(x)} \geq 0 \Rightarrow f(x) \neq 0 \Rightarrow x = -3, 0, 2$$

$$Dy = (-3, 0) \cup (0, 2) \Rightarrow \text{مجموعه } -2, -1, 1, 2$$

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$$f(x) - 2f(x) = x^2 - 3x + 5 \quad f(-2) = 9$$

$$f(2) - 2f(2) = 2^2 - 3(2) + 5 \Rightarrow -f(2) = 4 - 6 + 5 \Rightarrow f(2) = 1$$

$$f(-2) - 2f(2) = (-2)^2 - 3(-2) + 5 \Rightarrow f(-2) - 2(1) = 4 + 6 + 5 \Rightarrow f(-2) + 2 = 15 \Rightarrow f(-2) = 13$$

$$f(-2) = 13$$

-۴

$$f(x) = \begin{cases} x - \sqrt{x+4} & x \geq 3 \\ 2x+3 & x < 3 \end{cases} \quad f(f(5)) + f(f(1))$$

$$f(1) \Rightarrow 5 \quad f(5) = 5 - \sqrt{5+4} = 2 \quad f(2) = 2 + 2 = 4$$

-۵

$$f(x) = ax^2 - bx + 2$$

$$f(x-1) - f(x) = 4x + 2$$

$$a - b = 8$$

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$$f(x-1) = ax^2 - bx + 9x + 1$$

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

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

$$-2ax + a + b = 4x + 2 \Rightarrow a = -3, a + b = 2 \Rightarrow -3 + b = 2 \Rightarrow b = 5 \quad a - b = -3 - 5 = -8$$

$$f(x) = x^2 - 3x + 1$$

$$f(3) = \frac{3^2}{2} - \frac{3(3)}{-1} + 1 = 1$$

$$3f(3) + f(1)$$

$$f(-1) = \frac{(-1)^2}{2} - \frac{3(-1)}{-1} + 1 = 1$$

$$f^2(3)$$

$$f(3) = \frac{3^2}{2} - \frac{3(3)}{-1} + 1 = -1$$

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

-4

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$$f(x) = \begin{cases} 3x+1 & x \geq 3 \\ x^2 & x < 3 \end{cases}$$

$$\frac{3f(3) - 3f(-3)}{f(3)}$$

$$f(3) \Rightarrow 13$$

$$f(-3) \Rightarrow 9$$

$$f(3) \Rightarrow 13$$

$$\frac{3(13) - 3(9)}{13} = \frac{24 - 27}{13} = -\frac{3}{13}$$

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$$f = \{(1, 4), (2, 9), (3, 1), (4, 9)\}$$

$$\frac{f(f(1)) - f(f(2))}{f(1) - 2} = \frac{4 - 9}{1 - 2} = \frac{-5}{-1} = 5$$

-9

$$f(x) = \frac{x^2 + 5x + 4}{x^2 + 5x + 4} = \frac{(x+2)^2 + 1}{(x+2)^2 + 1}$$

$$f(f(\sqrt{3-2})) = f(\sqrt{3-2}) = \frac{(\sqrt{3-2})^2 + 5(\sqrt{3-2}) + 4}{(\sqrt{3-2})^2 + 5(\sqrt{3-2}) + 4} = \frac{3+4}{3+4} = \frac{7}{7} = 1$$

$$f(3) = \frac{(3+2)^2 + 1}{(3+2)^2 + 1} = \frac{25+1}{25+1} = \frac{26}{26} = 1$$

-10

$$f(x) = x^2 + \frac{1}{x^2}$$

$$(f(\sqrt{x}))^2 - f(x) = (\sqrt{x})^2 + \frac{1}{(\sqrt{x})^2} - \left(x + \frac{1}{x}\right) = x + \frac{1}{x} - x - \frac{1}{x} = 0$$

$$f(x) = x^2 + \frac{1}{x^2} \Rightarrow x^2 + \frac{1}{x^2} + x - x^2 - \frac{1}{x^2} = 0$$