

(در دفتر)

تالیف شده

فاطمه سلیمانی

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

$$x f(x) \geq 0$$

↙ ↘
0 -1, 2, 4

سوال (۱)

$$= \frac{1}{-4} + \frac{1}{0} - \frac{1}{2} + \frac{1}{4} =$$

$$D_f = [-4, 0] \cup [2, 4]$$

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

↙ ↘
-3, 0, 2, 4

سوال (۲)

$$D_f = (-3, 0) \cup (0, 2) \cup (4, +\infty)$$

$$= \frac{1}{-3} + \frac{1}{0} + \frac{1}{2} - \frac{1}{4}$$

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$$-2x - 2x^2$$

سوال (۳)

$$f(x) = -2f(2), x^2 - 3x + 4$$

$$f(2) = -2f(2), 4 - 6 + 4$$

$$-f(2) = 2$$

$$f(2) = -2$$

$$f(x) + 4 = x^2 - 3x + 4$$

$$f(-2) + 4 = 4 + 6 + 4 \quad \downarrow x = -2$$

$$f(-2) = 10$$

سوال (۴)

$$f(x) = \begin{cases} x - \sqrt{x+4} & x > 4 \\ 2x+3 & x \leq 4 \end{cases}$$

$$f(f(4)) = f(f(1))$$

$$4 - \sqrt{4+4} = 2$$

$$2x+3 = 2$$

$$2x+1+3 = 4$$

$$4 - \sqrt{4+4} = 2$$

$$2x+2 = 9$$

سوال (۵)

$$a(n-1)^2 - b(n-1) + 2 = an^2 + bn - 2 = 4n+2$$

$n^2 - 2n + 1$

$$a-b = ?$$

$-3 - 4 = -1$

$$an^2 - 2an + a - bn + b + 2 = an^2 + bn - 2 = 4n+2$$

$$-2a = 4 \Rightarrow a = -2$$

$$a+b = 2 \Rightarrow b = 4$$

$$f(x) = x^2 - 3x + 1 \Rightarrow \frac{f(3) + f(-1)}{f'(2)} \rightarrow \frac{2+1-4}{(-1)^2} = \frac{1}{1} = 1 \quad (\text{سوال 6})$$

$$f(3) = 9 - 9 + 1 = 1 \quad f(-1) = 1 - 3 + 1 = -1 \quad f'(2) = 2 - 3 = -1$$

$$\frac{f(f(4)) - f(f(-2))}{f(2)} = \frac{39 - 2 \times 4}{1} = \frac{31}{1} = 31 \quad (\text{سوال 7})$$

$$f(4) = 16 - 12 + 1 = 5 \quad f(-2) = 4 - 6 + 1 = -1 \quad f(2) = 4 - 6 + 1 = -1$$

$$\frac{f(f(4)) - f(f(-2))}{f(1) - 2} = \frac{5 - (-1)}{1 - 2} = \frac{6}{-1} = -6 \quad (\text{سوال 8})$$

$$\frac{f(f(\sqrt{3}-2))}{f(2)} = \frac{f(2)}{4 + 1 + 4} = \frac{1}{9} \quad (\text{سوال 9})$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 9}{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 4} = \frac{3 - 4\sqrt{3} + 4 + 4\sqrt{3} - 8 + 9}{3 - 4\sqrt{3} + 4 + 4\sqrt{3} - 8 + 4} = \frac{8}{2} = 4$$

$$= \frac{1}{9} = \frac{1}{9}$$

$$(f(\sqrt{n}))^2 - f(n) = \quad (\text{سوال 10})$$

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

$$n^2 + 1 + \frac{1}{n^2} - n^2 - \frac{1}{n^2} = 1$$