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نام و نام خانوادگی آریین لیسروانی فر پاسخنامه تشریحی تکلیف شماره ۷ کلاس (للم لیسروانی B)

	-4	-5	0	2	5
n	-	-	0	+	+
f(n)	+	0	-	-	0
nf(n)	-	+	0	-	0

$$\rightarrow Df = [-5, 0] \cup [2, 5]$$

(۲)

$$\frac{-3}{-} + \frac{0}{+} + \frac{2}{-} - \frac{5}{-}$$

$$y = \sqrt{\frac{-n}{f(n)}}$$

n = {-3, 0, 2, 5} برابر با صفر است.

شامل ۳ عدد صحیح اول، ۲ و -۲

$$Df = (-3, 0) \cup (0, 2)$$

$$\text{if } n=2 \rightarrow f(2) - 2f(2) = 2 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

$$\text{if } n=-2 \rightarrow f(-2) + 2 = 1 \rightarrow f(-2) = -1$$

(۲)

$$\underbrace{f(f(5))}_2 + \underbrace{f(f(1))}_5 = 7 + 2 = 9$$

(۲)

$$f(n) = \begin{cases} n - \sqrt{n+1} & , n > 1 \\ n+1 & , n \leq 1 \end{cases}$$

$$f(n) = an^2 - bn + 2$$

$$\rightarrow f(n-1) = a(n-1)^2 - b(n-1) + 2 = an^2 - 2an + a - bn + b + 2$$

$$f(n-1) - f(n) = \cancel{an^2} - 2an + a - \cancel{bn} + b + 2 - \cancel{an^2} + \cancel{bn} - 2 =$$

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

$$-b(n-1) = -bn + b$$

$$-2an = 4n$$

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

$$\begin{cases} a = -3 \\ b = 4 \end{cases}$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2)^2 + 2(\sqrt{3}-2) + 5}{(\sqrt{3}-2)^2 + 2(\sqrt{3}-2) + 1} = \frac{3 - 4\sqrt{3} + 4 + 2\sqrt{3} - 4 + 2}{3 - 4\sqrt{3} + 4 + 2\sqrt{3} - 4 + 1} = \frac{2}{1} = 2 \quad \text{✓} \quad \textcircled{2}$$

در جمع اعداد مثبت می توان کسرها را به این گونه نوشت:

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

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

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

$$f(-3) = (-3)^2 + 2 = 11 \quad \text{✓} \quad \textcircled{2}$$

$$f(n) = \{(2, 0), (1, -2), (0, 2), (\sqrt{2}, 1)\}$$

$$g(n) = \sqrt{9 - n^2} \quad \sqrt{9 - n^2} \rightarrow 9 - n^2 \geq 0 \rightarrow 9 \geq n^2 \rightarrow \begin{cases} n \geq -3 \\ n \leq 3 \end{cases}$$

$$g(n) = \{(-3, 0), (3, 0), (2, \sqrt{5}), (-2, \sqrt{5}), (0, 3), (-1, \sqrt{8}), (1, \sqrt{8})\}$$

الف) $\frac{f}{g} = \{(2, 0), (1, -\frac{2}{\sqrt{8}}), (0, \frac{2}{3})\}$ ✓ $\textcircled{2}$

ب) $\frac{g}{f} = \{(\cancel{2, 0}), (1, \frac{\sqrt{8}}{2}), (0, \frac{3}{2})\}$ ✓ $\textcircled{2}$

الف) $2f(n) = \{(2, 2), (3, 1), (-5, 2), (1, -2)\}$

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

ج) $3f^2(n) + 1 = \{(2, 9), (3, 19), (-5, 13), (1, -1)\}$ $\textcircled{1, 2, 3}$

د) $f(2n) = \{(1, 1), (\frac{3}{2}, 2), (\frac{-5}{2}, 2), (\frac{1}{2}, -2)\}$ $\textcircled{1, 2, 3}$

الف) $f - g = \{(1, 2), (2, 2), (3, 2)\}$

ب) $\frac{2f}{g} = \{(\cancel{1, 2}), (2, 4), (3, -2)\}$ ✓ $\textcircled{2}$