

19, 175 آزمون امید روش

$$f(u) = \sqrt{u + 4\sqrt{u-4}} = \sqrt{u-4 + 4 + 4\sqrt{u-4}} = \sqrt{(\sqrt{u-4} + 2)^2} = \underbrace{|\sqrt{u-4} + 2|}_{\text{مقدار مثبت}} = \sqrt{u-4} + 2$$

$$g(u) = \sqrt{u-4}\sqrt{u-4} = \sqrt{u-4 + 4 - 4\sqrt{u-4}} = \sqrt{(\sqrt{u-4} - 2)^2} = |\sqrt{u-4} - 2| = \sqrt{u-4} - 2$$

مقدار مثبت

$$f(u) + g(u) = \sqrt{u-4} - 2 + 2 \rightarrow \begin{matrix} a=0 \\ b=2 \\ c=-4 \end{matrix} \rightarrow \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2}$$

$$f(u) = \frac{u+2}{u^2-4u+4} = \frac{u+2}{(u-2)(u-1)} \rightarrow R - f(u)$$

$$u=2 \rightarrow \frac{4}{(-1)(1)} = -4 \quad u=0 \rightarrow \frac{2}{4}$$

$$g/f(u) = \int (2, -\frac{1}{2}) \cup (0, 4)$$

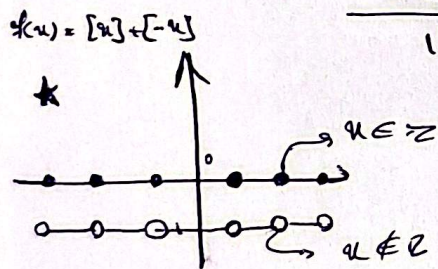
الف) $f(u) = \int (1, 2) \cup (2, -1) \cup (2, 2) \cup (-\frac{1}{2}, 4)$

ب) $f(u^2) = \int (1, 2) \cup (-1, 2) \cup (\sqrt{2}, -1) \cup (-\sqrt{2}, -1) \cup (2, 2) \cup (-2, 2)$

ج) $fg(u) + 1 = \int (-2, 1) \cup (1, 2) \cup (2, 4) \cup (-1, 1)$ د) $\frac{u}{g} = \int (1, 2) \cup (2, -1) \cup (-1, \frac{1}{2})$

$h = 2f + g \Rightarrow u+2=0 / u-2=0 / u+2(0)=4 \rightarrow \int (2, 2) \cup (2, 2) \cup (-2, 4)$

$$\left(\frac{f}{g+1}\right)(u) = \frac{\frac{\sqrt{u-4}}{u-2}}{\frac{[u] + [-u] + 1}{1}}$$

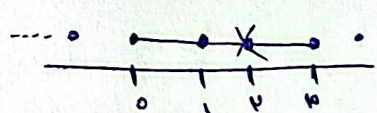


1) $u \geq 0 \rightarrow u \geq 0$

2) $\sqrt{u-4} \geq 0 \rightarrow \sqrt{u-4} \geq u \rightarrow u \geq u^2 \rightarrow u^2 - u \leq 0 \rightarrow u(u-1) \leq 0 \rightarrow u \in [0, 1]$

3) $u-2 \neq 0 \rightarrow u \neq 2 \rightarrow u \in \mathbb{Z}$

4) $[u] + [-u] \neq 1 \neq 0$



$\frac{f}{g+1} = \int (0, 1) \cup \{2\}$

$f(u) = \sqrt{5u - u^2 - 4} \rightarrow -u^2 + 5u - 4 \geq 0 \rightarrow u^2 - 5u + 4 \leq 0 \rightarrow (u-1)(u-4) \leq 0 \rightarrow u \in [1, 4]$

الف) $f = [1, 4]$

$h(u) = \frac{f(u)}{g(u)} \rightarrow g(u) \neq 0 \rightarrow \partial g = \{1, 2, 3, 4\}$

$h(u) = \int (1, 0) \cup (2, \frac{\sqrt{10-4-4}}{2}) \cup (4, 0)$

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الف) $y = u^3 - 10u^2 + 14u \rightarrow y - 1 = u^3 - 10u^2 + 14u - 1$

$y - 1 = (u - 1)^3 \rightarrow \sqrt[3]{y - 1} = u - 1 \rightarrow \sqrt[3]{y - 1} + 1 = u \rightarrow R = \mathbb{R} \quad (1, 10)$

ب) $y = \frac{1}{u^2 - 2u} \rightarrow y(u^2 - 2u) = 1 \rightarrow yu^2 - 2yu - 1 = 0 \rightarrow y \neq 0 \rightarrow u = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y}$
 $0 - 0 = 1 \times$
 $y = 0 \rightarrow 0 = 1$

$4y(y - 1) \geq 0 \rightarrow \frac{y-1}{y} \geq 0 \rightarrow R_f = (-\infty, -1] \cup [0, +\infty)$

الف) $y = u^2 - 4u + 10 \rightarrow y = (u - 2)^2 + 6 \rightarrow R = [6, +\infty)$
 ب) $y = -u^2 + 4u + 4 \rightarrow y = -(u - 2)^2 + 8 \rightarrow R = (-\infty, 8]$

ج) $y = \sqrt{u^2 - 4u - 5} \rightarrow \left| \frac{y}{-1} \right| \rightarrow \sqrt{(-1)^2 - 4(-1) - 5} \rightarrow R_f = [0, +\infty)$

د) $y = \sqrt{4u - u^2} \rightarrow \left| \frac{y}{1} \right| \rightarrow \sqrt{(-1)^2 - 4(-1) - 5} \rightarrow R = [0, 2]$

الف) $y = (u^2 - 4u + 4) \rightarrow R = [0, +\infty)$ ب) $y = u^2 + 4u + 4 \rightarrow R = [0, +\infty)$

ج) $y = \sqrt{u^2 + 4u + 4} \rightarrow R = [0, +\infty)$ د) $y = (u^2 - 4u + 4) \rightarrow R = [0, +\infty)$

نشان دهید که هر دو تابع در هر دو نقطه از دامنه خود مشتق پذیرند

الف) $y = \frac{u+1}{u-2} \rightarrow R = \mathbb{R} \setminus \{2\}$ ب) $y = \frac{u+1}{u+1} \rightarrow R = \mathbb{R} \setminus \{-1\}$

الف) $y = u^3 - 3u^2 + 2u - 1 + 1 = y = (u - 1)^3 + 1$
 $y - 1 = (u - 1)^3 \rightarrow \sqrt[3]{y - 1} = u - 1 \rightarrow u = \sqrt[3]{y - 1} + 1$

$R_f = \mathbb{R}$

ب) $y = \frac{1}{u^2 - 2u} \rightarrow y(u^2 - 2u) = 1 \rightarrow yu^2 - 2yu - 1 = 0$

$y \neq 0 \rightarrow u = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow 4y(y + 1) \geq 0 \rightarrow \frac{-1}{y} \leq 0$

$y = 0 \rightarrow 0 = 1 \times$ صحت ندارد! $\rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$