



$$\frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \div \frac{u-1}{2u^2 + 5u - 3} = \frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \cdot \frac{2u^2 + 5u - 3}{u-1}$$

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سوال ۱ -

الف) $\frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \rightarrow (1-u)(2u^2 + 5u - 3) \div (1-u)(1-2u)(u+3)$

بر $1-u$ بخشیدیم

ب) $\frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \rightarrow \frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \cdot \frac{2u^2 + 5u - 3}{2u^2 + 5u - 3} = \frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \cdot \frac{2u^2 + 5u - 3}{2u^2 + 5u - 3}$

تقسیم طولانی

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تقسیم طولانی

د) $\frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \rightarrow \frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \cdot \frac{2u^2 + 5u - 3}{2u^2 + 5u - 3} = \frac{2u^3 + 5u^2 - 11u + 3}{2u^2 + 5u - 3} \cdot \frac{2u^2 + 5u - 3}{2u^2 + 5u - 3}$

تقسیم طولانی

سوال ۲ -

الف) $\frac{u+3}{u^2 - 2u^2 + 2u - 1} \rightarrow \frac{u+3}{u^2 - 2u^2 + 2u - 1} \cdot \frac{u-1}{u-1} = \frac{(u+3)(u-1)}{(u^2 - 2u^2 + 2u - 1)(u-1)}$

ب) $\frac{u+3}{u^2 - 2u^2 + 2u - 1} \rightarrow \frac{u+3}{u^2 - 2u^2 + 2u - 1} \cdot \frac{u-1}{u-1} = \frac{(u+3)(u-1)}{(u^2 - 2u^2 + 2u - 1)(u-1)}$

تقسیم طولانی

ج) $\frac{u+3}{u^2 - 2u^2 + 2u - 1} \rightarrow \frac{u+3}{u^2 - 2u^2 + 2u - 1} \cdot \frac{u-1}{u-1} = \frac{(u+3)(u-1)}{(u^2 - 2u^2 + 2u - 1)(u-1)}$

تقسیم طولانی

د) $\frac{u+3}{u^2 - 2u^2 + 2u - 1} \rightarrow \frac{u+3}{u^2 - 2u^2 + 2u - 1} \cdot \frac{u-1}{u-1} = \frac{(u+3)(u-1)}{(u^2 - 2u^2 + 2u - 1)(u-1)}$

تقسیم طولانی

سوال ۳ -

الف) $|1-u| \geq |-u| \rightarrow u \geq 1$

ب) $|1-u| \geq u-1 \rightarrow u < 1$

ج) $|1-u| \geq u-1 \rightarrow u < 1$

د) $|1-u| \geq u-1 \rightarrow u < 1$

تقسیم طولانی

سوال ۴ -

الف) $[-u] - 2 \geq 0 \rightarrow [-u] \geq 2 \rightarrow -u \geq 2 \rightarrow u \leq -2$

ب) $z \geq [u] \rightarrow z^2 - 2z - 3 \geq (z-2)(z+1) \geq 0 \rightarrow z \geq 3, -1$

ج) $[u] \geq 3 \rightarrow 3 \leq u < 4$

د) $[u] \geq -1 \rightarrow -1 \leq u < 0$

تقسیم طولانی

سوال ۵ -

الف) $\sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \rightarrow \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \geq 0$

ب) $y = \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \rightarrow \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \geq 0$

ج) $y = \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \rightarrow \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \geq 0$

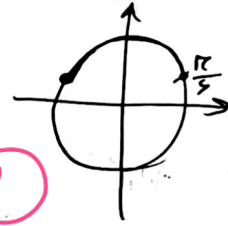
د) $y = \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \rightarrow \sqrt{[u-\frac{1}{3}]} + [\frac{1}{3}-u] \geq 0$

تقسیم طولانی

الف) $\frac{\cos t + 1}{\tan t + 1} \rightarrow \frac{\cos}{\sin} \rightarrow \sin \neq 0$
 $\tan t + 1 \rightarrow \frac{\sin}{\cos} \quad \cos \neq 0$
 $\tan t \neq -1$

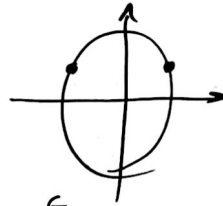
ب) $R = \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$

الف) $1 - \sqrt{\sin^2 u} > 0 \rightarrow 1 > \sqrt{\sin^2 u}$
 $\frac{1}{\sqrt{2}} > \sqrt{\sin^2 u} \rightarrow -\frac{1}{\sqrt{2}} < \sin u < \frac{1}{\sqrt{2}}$



$D = \left(k\pi - \frac{\pi}{8}, k\pi + \frac{7\pi}{8} \right)$

الف) $\sqrt{\sin^2 u} - 1 > 0 \rightarrow \sin u \geq \frac{1}{\sqrt{2}}$



$D = \left(k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right)$

ب) $1 - \sqrt{\cos^2 u} \geq 0 \rightarrow 1 \geq \sqrt{\cos^2 u} \rightarrow \cos u \leq \frac{1}{\sqrt{2}}$



$D = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{7\pi}{4} \right)$

الف) $-1 < u^2 + 2u + 1 \leq 1 \rightarrow u^2 + 2u + 1 < 1 \rightarrow u^2 + 2u < 0 \rightarrow u(u+2) < 0$
 $\rightarrow u^2 + 2u + 1 \geq -1 \rightarrow u^2 + 2u + 2 \geq 0 \rightarrow (u+1)^2 + 1 \geq 0$

ب) $\sqrt{u^2 + 2u + 1} \leq 1 \rightarrow$

① $u^2 + 2u + 1 \leq 1 \rightarrow u \geq -\frac{1}{2}$
 ② $u^2 + 2u + 1 \geq 1 \rightarrow u \leq -\frac{1}{2}$
 ③ $u^2 + 2u + 1 \leq 1 \rightarrow u \leq -\frac{1}{2}$
 ④ $u^2 + 2u + 1 \geq 1 \rightarrow u \geq -\frac{1}{2}$

$D = \left[-\frac{1}{2}, \frac{1}{2} \right]$

الف) $\log_2(1 - \frac{u}{2}) - u > 0 \rightarrow -\log_2 \frac{u}{2} + 1 > 0 \rightarrow \log_2 \frac{u}{2} < 1 \rightarrow u < 2 \rightarrow D = (0, 2)$

ب) $\log_2(1 - \log_2 \frac{u}{2}) - u > 0 \rightarrow 1 - \log_2 \frac{u}{2} > 0 \rightarrow \log_2 \frac{u}{2} < 1 \rightarrow u < \frac{1}{2} \rightarrow D = \left(\frac{1}{2}, +\infty \right)$

الف) $\frac{u-u^2}{2} - 1 > 0 \rightarrow u - u^2 \geq 2 \rightarrow u \geq 2 \rightarrow u^2 - u + 2 \leq 0 \rightarrow (u-2)(u-1) \leq 0$
 $1 \leq u \leq 2$

ب) $\frac{u-u^2}{2} \in W \rightarrow u-u^2 \geq 2W \rightarrow u - u^2 \geq -\Delta + 2W$

$\rightarrow \{u \mid u = \frac{\Delta - 2W}{2 - u^2} \mid u \in W\}$

ب- ۱ $\sqrt{5-2n} \rightarrow 5-2n \geq 0 \rightarrow n \leq \frac{5}{2}$

$\rightarrow D_f = \left[2, \frac{5}{2}\right]$

$-1 \leq \sqrt{5-2n} \leq 1 \rightarrow 5-2n \leq 1 \rightarrow -2n \leq -4 \rightarrow n \geq 2$

همواره برقرار است ✓