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الف) $y = \frac{x+3}{2x^3+3x^2-11x+3} \rightarrow 0 = \text{جمع ضرایب} = (x-1) \text{ بخش پذیر بر } \xrightarrow{\div (x-1)} (x-1)(2x^2+5x-3)$

$D_f = \mathbb{R} - \{3, \frac{1}{2}, 1\}$ ✓

① $2(x+3)(x-\frac{1}{2})$
② $(-3) \quad (\frac{1}{2})$

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ب) $y = \frac{x+3}{2x^3+9x^2+10x+3} \rightarrow \text{جمع ضرایب اولی خد} \Rightarrow (x+1) \text{ بخش پذیر بر } \xrightarrow{\div (x+1)} (x+1)(2x^2+7x+3)$

$D_f = \mathbb{R} - \{-1, -\frac{1}{2}, -3\}$ ✓

① $2(x+3)(x+\frac{1}{2})$
② $(-3) \quad (-\frac{1}{2})$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} \rightarrow 0 = \text{جمع ضرایب} = (x-1) \text{ بخش پذیر بر } \xrightarrow{\div (x-1)} (x-1)(x^2-x+1)$

$D_f = \mathbb{R} - \{1\}$ ✓

① $(x-1)(x^2-x+1)$

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}} \rightarrow 0 = \text{جمع ضرایب} = (x-1) \text{ بخش پذیر بر } \xrightarrow{\div (x-1)} \sqrt{\frac{(x+3)}{(x-1)(x^2-x+1)}} \geq 0$

$D_f = \mathbb{R} - (-\infty, 1]$ ✓

① $(x-1)(x^2-x+1)$
② (-3)
③ (x^2-x+1)
④ $\Delta < 0$

$y = \frac{2}{x^2-5|x-1|-2x+5}$

$D_f = \mathbb{R} - \{5, 2, 0, -3\}$ ✓

① x^2-5x+5
② x^2-2x
③ $(x-5)(x-1)$
④ $x(x-2)$
⑤ $(5) \quad (1)$
⑥ $(0) \quad (-2)$

الف) $y = \frac{x+3}{|2x+1|-|x+3|} \rightarrow |2x+1|-|x+3| \neq 0 \sim |2x+1| \neq |x+3| \xrightarrow{\text{قضیه}} 4x^2+6x+1 \neq x^2+6x+9$

$\rightarrow 3x^2-2x-8 \neq 0 \rightarrow 3(x-2)(x+\frac{4}{3})$

$D_f = \mathbb{R} - \{2, -\frac{4}{3}\}$ ✓

① (2)
② $(-\frac{4}{3})$

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ب) $y = \sqrt{|2x+1|-|x+3|} \sim |2x+1|-|x+3| \geq 0 \sim |2x+1| \geq |x+3| \xrightarrow{\text{قضیه}} 4x^2+6x+1 \geq x^2+6x+9$

$\rightarrow 3x^2-2x-8 \geq 0 \rightarrow 3(x-2)(x+\frac{4}{3}) \geq 0$

$D_f = \mathbb{R} - (-\frac{4}{3}, 2)$ ✓

① $(-\frac{4}{3})$
② (2)

(۳)

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یازدهم بهر

الف) $y = \log_r (1 - \log_r^k)$

$x > 0 \quad I$

$1 - \log_r^k > 0 \rightarrow \log_r^k < 1 \xrightarrow{I \cap II} Df = (0, 3) \quad \checkmark$

$x < 3 \quad II$

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ب) $y = \log_r (1 - \log_r^{\frac{x}{2}})$

$x > 0 \quad I$

$1 - \log_r^{\frac{x}{2}} > 0 \sim \log_r^{\frac{x}{2}} < 1 \xrightarrow{I \cap II} Df = (\frac{1}{2}, +\infty) \quad \checkmark$

$x > \frac{1}{2} \quad II$

$f(x) = \sqrt{\log_{\alpha \Delta}^{(2x-1)}}$

$2x-1 > 0 \sim x > \frac{1}{2} \quad I$

$\log_{\alpha \Delta}^{(2x-1)} > 0 \sim 2x-1 > 1 \sim x > 1 \quad II$

$I \cap II \cap III \rightarrow Df = (1, 3) \quad \checkmark$

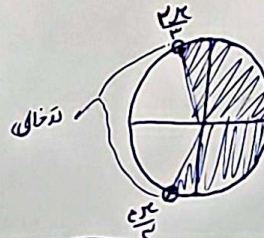
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$\log_{\alpha \Delta}^{(2x-1)} \geq 0 \sim \log_{\alpha \Delta}^{(2x-1)} \leq 1 \sim 2x-1 \leq \Delta \sim x \leq 3 \quad III$

الف) $y = \log^{(2 \cos x + 1)}$

$2 \cos x + 1 > 0 \sim \cos x > -\frac{1}{2}$

$Df = (2K\pi - \frac{2\pi}{3}, 2K\pi + \frac{2\pi}{3}) \quad \checkmark$



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ب) $y = \sqrt{\log \frac{x-1}{x+1}}$

$\frac{x-1}{x+1} > 0 \xrightarrow{+ \frac{1}{x+1} - \frac{1}{x+1}} (-\infty, -1) \cup (1, +\infty) \quad I$

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$\log \frac{x-1}{x+1} > 0 \sim \frac{x-1}{x+1} > 1 \sim \frac{-2}{x+1} > 0 \xrightarrow{+ \frac{1}{x+1} - \frac{1}{x+1}} (-\infty, -1) \quad II$

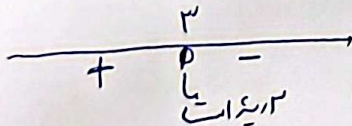
$I \cap II \rightarrow Df = (-\infty, -1) \quad \checkmark$

$f(x) = \sqrt{(a+x)x^2 + ax + b}$

چون عبارت زیر رادیکال باید مثبت باشد $\Rightarrow 0 = x^2 - a + x - b \rightarrow a = -2$

$f(x) = \sqrt{-2x + b} \xrightarrow{\text{If } x=3} -2+b=0 \sim b=2 \quad \checkmark$

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$f(x) = \sqrt{x^2 + 2x - m^2}$

$\Delta \leq 0 \xrightarrow{\text{چون برای هر x در R تعریف می شود}} f - A + Em \leq 0 \sim Em^2 - E \leq 0$

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$m_{\max} - m_{\min} = 1 - (-1) = 2 \quad \checkmark$

$-1 \leq m \leq 1 \quad \checkmark$

$f(x) = \frac{\sqrt{x^2 - m^2}}{[x] + E[x] + 1} \xrightarrow{f - m^2 > 0 \sim x^2 - E \leq 0 \sim -2 \leq x \leq 2 \quad I}$

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$\{k \mid k \in \mathbb{Z}, k \in Df\} \Rightarrow K = \{-2, -1, 0, 1, 2\}$

$[x] + [-x] + 1 \neq 0 \sim [x] + [-x] \neq -1 \sim x \notin \mathbb{R} - \mathbb{Z} \xrightarrow{\sim} K(K) = \emptyset \quad \checkmark$

$= x \in \mathbb{Z} \quad \checkmark$