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نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۳ کلاس: پایه دهم

الف) $f(x) = \frac{x+3}{2x^2+3x^2-4x+3} = \frac{x+3}{(x-1)(2x^2+5x-3)} = \frac{x+3}{(x-1)(x-1/2)(x+3)} \rightarrow x \neq 1, -1/2, -3$
 $\rightarrow D_f = \mathbb{R} - \{1, -1/2, -3\}$ ✓

ب) $f(x) = \frac{x+3}{2x^2+9x^2+10x+3} = \frac{x+3}{(x+1)(2x^2+7x+3)} = \frac{x+3}{(x+1)(x+3)(x+1/2)} \rightarrow x \neq -1, -3, -1/2$
 $\rightarrow D_f = \mathbb{R} - \{-1, -3, -1/2\}$ ✓

الف) $y = \frac{x+3}{x^2-2x^2+2x-1} \Rightarrow x^2-2x^2+2x-1 \neq 0 \rightarrow (x+1)(x^2-x+1) \neq 0$
 $\rightarrow x \neq -1 \rightarrow D_f = \mathbb{R} - \{-1\}$ ✓

ب) $y = \sqrt{\frac{x+3}{x^2-2x^2+2x-1}} \rightarrow \frac{x+3}{x^2-2x^2+2x-1} \geq 0 \rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0$
 $\rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$ ✓

f(x), $\frac{x+3}{x^2-5|x-1|-2x+5} \rightarrow x^2-5|x-1|-2x+5 \neq 0$
 $\rightarrow \begin{cases} x-1 > 0 \rightarrow x > 1 \rightarrow x^2-5x+5-2x+5 \neq 0 \rightarrow x^2-7x+10 \neq 0 \rightarrow (x-2)(x-5) \neq 0 \rightarrow x \neq 2, 5 \\ x-1 < 0 \rightarrow x < 1 \rightarrow x^2+5x-5-2x+5 \neq 0 \rightarrow x^2+3x \neq 0 \rightarrow x(x+3) \neq 0 \rightarrow x \neq 0, -3 \end{cases}$
 $\rightarrow D_f = \mathbb{R} - \{2, 5, 0, -3\}$ ✓

الف) $\frac{x+3}{|2x+1|-|x+3|} \rightarrow |2x+1|-|x+3| \neq 0$
 $\rightarrow \begin{cases} x \geq -1/2, x-3 \neq 0 \rightarrow x \neq 3 \\ x < -1/2, -2x-1-x-3 \neq 0 \rightarrow -3x-4 \neq 0 \rightarrow x \neq -4/3 \end{cases}$
 $\rightarrow D_f = \mathbb{R} - \{3, -4/3\}$ ✓

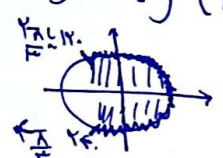
الف) $y = \log_2(1-\log_2 x)$
 $\rightarrow x > 0, 1-\log_2 x > 0 \rightarrow \log_2 x < 1 \rightarrow x < 2$
 $\rightarrow D_f = (0, 2)$ ✓

ب) $y = \log_2(1-\log_2 \frac{1}{x})$
 $\rightarrow x > 0, 1-\log_2 \frac{1}{x} > 0 \rightarrow \log_2 \frac{1}{x} < 1 \rightarrow x > \frac{1}{2}$
 $\rightarrow D_f = (\frac{1}{2}, +\infty)$ ✓

$$f(n) = \sqrt{\frac{\log(r_{n-1})}{\log a}}$$

$$\begin{aligned} &\rightarrow r_{n-1} > 0 \rightarrow n > \frac{1}{r} \quad \textcircled{1} \quad \log r_{n-1} > 0 \rightarrow r_{n-1} > 1 \quad \textcircled{2} \\ &\rightarrow r_n > r \rightarrow n > 1 \quad \textcircled{3} \quad \log r_{n-1} \geq 1 \rightarrow \log r_{n-1} \leq 1 \rightarrow r_{n-1} \leq a \\ &\rightarrow r_n \leq 4 \rightarrow n \leq r \quad \textcircled{1} \wedge \textcircled{2} \wedge \textcircled{3} \rightarrow 1 < n < r \rightarrow D_f(1, r) \checkmark \end{aligned}$$

الف) $y = \log(r \cos n + 1) \rightarrow r \cos n + 1 > 0 \rightarrow r \cos n > -1 \rightarrow \cos n > -\frac{1}{r}$



$$n \in \left(k\pi - \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right) \checkmark$$

ب) $y = \sqrt{\log \frac{n-1}{n+1}}$

$$\begin{aligned} \textcircled{1} &\rightarrow \frac{n-1}{n+1} > 0 \rightarrow \frac{-1}{+1} = \frac{-1}{+1} \\ \textcircled{2} &\rightarrow \log \frac{n-1}{n+1} > 0 \rightarrow \frac{n-1}{n+1} > 1 \rightarrow \frac{n-1-n+1}{n+1} > 0 \rightarrow \frac{-r}{n+1} > 0 \\ &\rightarrow \frac{-r}{n+1} > 0 \rightarrow n < -r-1 \quad \textcircled{1} \wedge \textcircled{2} \rightarrow (-\infty, -1) \checkmark \end{aligned}$$

$$f(n) = \sqrt{(a+r)n^r + an + b}$$

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$$\begin{aligned} &\textcircled{1} \rightarrow \text{مقادير موجبة} \rightarrow a+r > 0 \rightarrow a > -r \rightarrow -r < n < b \\ &\rightarrow -r < n < b \rightarrow b < 4 \checkmark \end{aligned}$$

$$f(n) = \sqrt{n^r + r_n + r_{-n}^r} \quad D_f \subset \mathbb{R}$$

$$n^r + r_n + r_{-n}^r \geq 0 \rightarrow \Delta \leq 0 \rightarrow f - f(r_{-n}^r) \leq 0$$

$$\begin{aligned} &\rightarrow f - n + f n^r \leq 0 \rightarrow -f + f n^r \leq 0 \rightarrow f n^r < f \rightarrow n^r < 1 \rightarrow -1 < n < 1 \\ &\quad |1-f| \cdot \textcircled{2} \checkmark \end{aligned}$$

$$f(n) = \frac{\sqrt{f-n^r}}{[n] + [-n] + 1}$$

$$\textcircled{1} \rightarrow [n] + [-n] + 1 \neq 0 \rightarrow \begin{cases} n \in \mathbb{Z} [n] + [-n] \neq 0 \\ n \notin \mathbb{Z} [n] + [-n] = 0 \end{cases}$$

$$\begin{aligned} &\rightarrow n \in \mathbb{Z} \quad \textcircled{1} \rightarrow f - n^r \geq 0 \rightarrow n^r \leq f \rightarrow -r \leq n \leq r \\ &\rightarrow n \in \{-r, -1, 0, 1, r\} \rightarrow \text{مربع موجبة} \checkmark \end{aligned}$$