

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۳ کلاس
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الف) $2n^3 + 3n^2 - 8n + 3 \neq 0 \rightarrow (n-1)(n-\frac{1}{2})(n+3) \neq 0 \rightarrow D = \mathbb{R} - \{1, \frac{1}{2}, -3\}$

ب) $2n^3 + 9n^2 + 10n + 3 \neq 0 \rightarrow (n+1)(n+3)(n+\frac{1}{2}) \neq 0 \rightarrow D = \mathbb{R} - \{-3, -1, -\frac{1}{2}\}$

الف) $n^3 - 2n^2 + 2n - 1 \neq 0 \rightarrow (n-1)(n^2 - n + 1) \neq 0 \rightarrow D = \mathbb{R} - \{1\}$
 دایره مقعر دارد

ب) $\frac{n+3}{n^3 - 2n^2 + 2n - 1} \geq 0 \rightarrow \frac{n+3}{(n-1)(n^2 - n + 1)} \geq 0 \rightarrow \frac{-3}{+ \quad - \quad +} \rightarrow D = (-\infty, -3] \cup (1, +\infty)$
 دایره مقعر ندارد

$n^2 - 5|n-1| - 2n + 5 \neq 0 \rightarrow n^2 - 2n + 1 + 4 - 5|n-1| = (n-1)^2 + 4 - 5|n-1|$
 $= \underbrace{|n-1|^2}_t - 5|n-1| + 4 = t^2 - 5t + 4 \neq 0 \rightarrow \begin{cases} t=4 \rightarrow |n-1|=4 \rightarrow \begin{cases} n-1=4 \rightarrow n=5 \\ n-1=-4 \rightarrow n=-3 \end{cases} \\ t=1 \rightarrow |n-1|=1 \rightarrow \begin{cases} n-1=1 \rightarrow n=2 \\ n-1=-1 \rightarrow n=0 \end{cases} \end{cases}$
 $\Rightarrow D = \mathbb{R} - \{-3, 0, 2, 5\}$

الف) $[n] - 2 \geq 0 \rightarrow [n] \geq 2 \rightarrow -n \geq 2 \rightarrow n \leq -2 \rightarrow D = (-\infty, -2]$

ب) $[n]^2 - 2[n] - 3 \neq 0 \rightarrow ([n]+1)([n]-3) \neq 0 \rightarrow \begin{cases} [n]=-1 \rightarrow n = [-1, 0) \\ [n]=3 \rightarrow n = [3, 4) \end{cases}$
 $\Rightarrow D = \mathbb{R} - [-1, 0) \cup [3, 4)$

الف) $[\frac{n-\frac{1}{k}}{n-\frac{1}{k}}] + [\frac{n+\frac{1}{k}}{n+\frac{1}{k}}] \geq 0 \rightarrow [\frac{n+\frac{1}{k}}{n+\frac{1}{k}}] - 1 + [\frac{n+\frac{1}{k}}{n+\frac{1}{k}}] \geq 0 \rightarrow 2[\frac{n+\frac{1}{k}}{n+\frac{1}{k}}] - 1 \geq 0 \rightarrow [\frac{n+\frac{1}{k}}{n+\frac{1}{k}}] \geq \frac{1}{2}$
 $\Rightarrow n + \frac{1}{k} \geq 1 \rightarrow n \geq 1 - \frac{1}{k} \rightarrow D = [\frac{1}{k}, +\infty)$

ب) $[\frac{n-\frac{1}{k}}{n-\frac{1}{k}}] + [\frac{1}{k} - n] \geq 0 \rightarrow \begin{cases} a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \\ a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \end{cases} \xrightarrow{\text{نادرست}} n - \frac{1}{k} \in \mathbb{Z}$
 $\Rightarrow D = \{n | n = k - \frac{1}{k}, k \in \mathbb{Z}\}$

ا) $\begin{cases} \cot x = \frac{\cos x}{\sin x} \Rightarrow \sin x \neq 0 \\ \tan x + 1 \neq 0 \rightarrow \tan x \neq -1, \tan x = \frac{\sin x}{\cos x} \rightarrow \cos x \neq 0 \end{cases}$ $\hookrightarrow D = \mathbb{R} - \{K\pi, K\pi + \frac{\pi}{2}, K\pi - \frac{\pi}{2}\}$ ب) $1 - \cos^2 x \geq 0 \rightarrow \sin^2 x \leq 1 \rightarrow -1 \leq \sin x \leq 1$ $\hookrightarrow D = [K\pi - \frac{\pi}{2}, K\pi + \frac{\pi}{2}] \cup [K\pi + \frac{3\pi}{2}, K\pi + \frac{5\pi}{2}]$		6
ا) $1 - \sin x \geq 0 \rightarrow \sin x \leq 1 \rightarrow D = [K\pi + \frac{3\pi}{2}, K\pi + \frac{5\pi}{2}]$ ب) $1 - \cos x \geq 0 \rightarrow \cos x \leq 1 \rightarrow D = [K\pi + \frac{\pi}{2}, K\pi + \frac{3\pi}{2}]$	 	7
ا) $-1 \leq x^2 + 2x + 1 \leq 1 \rightarrow \begin{cases} x^2 + 2x + 1 \geq -1 \rightarrow (x+1)(x+3) \geq 0 \rightarrow \frac{x+1}{x+3} \geq 0 \text{ ① } (-\infty, -3] \cup [-1, +\infty) \\ x^2 + 2x + 1 \leq 1 \rightarrow x(x+2) \leq 0 \rightarrow \frac{x}{x+2} \leq 0 \text{ ② } [-2, 0] \end{cases}$ $\hookrightarrow \text{①} \cap \text{②} \Rightarrow D = [-2, -1]$ ب) $\Delta - 2x \geq 0 \rightarrow \Delta \geq 2x \rightarrow x \leq \frac{\Delta}{2} \text{ ①}$ $\hookrightarrow -1 \leq \sqrt{\Delta - 2x} \leq 1 \rightarrow \Delta - 2x \leq 1 \rightarrow x \leq \frac{\Delta - 1}{2} \rightarrow x \leq \frac{\Delta}{2} \text{ ②}$ $\Rightarrow \text{①} \cap \text{②} \Rightarrow D = [\frac{\Delta - 1}{2}, \frac{\Delta}{2}]$		8
ا) $\begin{cases} x > 0 \text{ ①} \\ 1 - \log_{\frac{1}{x}} x > 0 \rightarrow \log_{\frac{1}{x}} x < 1 \xrightarrow{1 < x} x < \frac{1}{x} \text{ ②} \end{cases} \Rightarrow \text{①} \cap \text{②} \Rightarrow D = (0, \frac{1}{2})$ ب) $\begin{cases} x > 0 \text{ ①} \\ 1 - \log_{\frac{1}{x}} x > 0 \rightarrow \log_{\frac{1}{x}} x < 1 \xrightarrow{0 < \frac{1}{x} < 1} x > 1 \text{ ②} \end{cases} \Rightarrow \text{①} \cap \text{②} \Rightarrow D = (1, +\infty)$		9
ا) $x^{2n} - x^r > 0 \rightarrow x^{2n-r} > x^r \rightarrow x^{2n-r-2r} > 0 \rightarrow -x^r > x^{-r} \rightarrow \frac{-x^r}{-1+x^r} > 0$ $\hookrightarrow D = [1, 2]$ ب) $\frac{x^{2n} + \Delta}{x^{2n} + x} \in W \rightarrow x \in -\frac{xW - \Delta}{xW - x} \rightarrow D = \{x \mid x = \frac{-xK + \Delta}{xK - x}, K \in W\}$		10