

نام و نام خانوادگی نیا پیش نیاز و بیان پاسخنامه تشریحی تکلیف شماره ۶ کلاس (نام و نام خانوادگی)

الف) $y = \sqrt{\frac{x^4 - 4x}{x^3 - x}} = \sqrt{\frac{x(x-4)}{x(x-1)(x+1)}} \geq 0$ $\frac{x-4}{(x-1)(x+1)} \geq 0$ $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $y = \sqrt{\frac{x^5 - x^3}{x^3 - x}} = \sqrt{\frac{x^3(x-1)(x+1)}{x(x-1)(x+1)}} \geq 0$ $D_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \Rightarrow x+|x| > 0 \Rightarrow |x| > -x$ $D_f = \mathbb{R}^+$

ب) $y = \frac{1}{\sqrt{x|x|}}$ $|x| > 0$
 $D_f = \mathbb{R}^+$

الف) $y = \sqrt{2-[x]}$ $2-[x] \geq 0$ $[x] \leq 2 \Rightarrow x < 3$ $D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-[x]}}$ $2-[x] > 0$ $[x] < 2 \Rightarrow x < 2$ $D_f = (-\infty, 2)$

الف) $y = \sqrt{[x - \frac{1}{3}] + [x + \frac{1}{3}]} \Rightarrow [x - \frac{1}{3}] + [x + \frac{1}{3}] \geq 0$
 $[x + \frac{1}{3}] = [x - \frac{1}{3}] + 1 \Rightarrow [x - \frac{1}{3}] + ([x - \frac{1}{3}] + 1) \geq 0$
 $= 2[x - \frac{1}{3}] + 1 \geq 0 \Rightarrow 2[x - \frac{1}{3}] \geq -1 \Rightarrow [x - \frac{1}{3}] \geq -\frac{1}{2}$
 $[a] + [-a] = 0$
 $x - \frac{1}{3} \in \mathbb{Z} \Rightarrow D_f = \{x | x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

الف) $y = \frac{1}{\sin x - 1}$ $\sin x - 1 \neq 0$ $\sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $y = \frac{1}{\sin^2 x - 1}$ $\sin^2 x - 1 \neq 0$ $\sin^2 x \neq 1$ $\sin^2 x \neq \frac{1}{4}$
 $\sin x \neq \pm \frac{\sqrt{2}}{2}$ $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}$

الف) $y = \sqrt{r \sin x - 1}$ $r \sin x - 1 \geq 0 \Rightarrow r \sin x \geq 1$
 $\sin x \geq \frac{1}{r}$ $D = \left[r k \pi + \frac{\pi}{4}, r k \pi + \frac{3\pi}{4} \right]$

ب) $y = \sqrt{\cos x - 1}$ $\cos x - 1 \geq 0 \Rightarrow \cos x \geq 1$
 $D_p = \{ r k \pi \mid k \in \mathbb{Z} \}$

الف) $\cos y = |x| - r$ $-1 \leq \cos y \leq 1 \Rightarrow -1 \leq |x| - r \leq 1 \Rightarrow r \leq |x| \leq r+1$
 $D = [-r, -r] \cup [r, r]$

ب) $y = \arcsin(x^r + r x + 1)$ $x^r + r x + 1 \leq 1 \Rightarrow x^r + r x \leq 0$
 $-1 \leq x^r + r x + 1 \leq 1 \Rightarrow x(x+r) \leq 0 \Rightarrow -r \leq x \leq 0$
 $x^r + r x + 1 \geq -1 \Rightarrow x^r + r x + 2 \geq 0 \Rightarrow (x+1)(x+r) \geq 0$
 $x \leq -r \vee x \geq -1 \Rightarrow D = [-r, -1] \cup [-1, 0]$

الف) $y = \sqrt{r - \log_p(x-r)}$ $x-r > 0 \Rightarrow x > r$
 $r - \log_p(x-r) \geq 0 \Rightarrow \log_p(x-r) \leq r$

ب) $y = \log(x^r - x)$ $x-r \leq r^r \Rightarrow x \leq r+1 \cap x > r \Rightarrow D = (r, r+1]$
 $x^r - x > 0 \Rightarrow x(x-1)(x+1) > 0 \Rightarrow x \in (-1, 0) \cup (1, +\infty)$

الف) $y = \frac{r}{r^x + 1}$ $r^x + 1 \neq 0 \Rightarrow r^x \neq -1 \Rightarrow D_p = \mathbb{R}$

ب) $\frac{r}{r^x - 1}$ $r^x - 1 \neq 0 \Rightarrow r^x \neq 1 \Rightarrow x \neq 0 \Rightarrow D_p = \mathbb{R} - \{0\}$

ج) $\frac{r}{r^x - r}$ $r^x - r \neq 0 \Rightarrow r^x \neq r \Rightarrow x \neq \frac{1}{r} \Rightarrow D_p = \mathbb{R} - \left\{ \frac{1}{r} \right\}$

د) $\frac{r}{r^x - r^r}$ $r^x - r^r \neq 0 \Rightarrow r^x \neq r^r \Rightarrow x \neq \log_r r^r \Rightarrow D = \mathbb{R} - \{ \log_r r^r \}$

الف) $y = (r x + 1)!$ $r x + 1 \in \mathbb{W} \Rightarrow r x \in \mathbb{W} + 1 \Rightarrow x \in \frac{\mathbb{W} + 1}{r}$
 $D = \left\{ x \mid x = \frac{k+1}{r}, k \in \mathbb{W} \right\}$

ب) $y = \left(\frac{r x - r}{r x - r} \right)!$ $\frac{r x - r}{r x - r} \in \mathbb{W}$ $r x - r \in r \mathbb{W} - \Delta \mathbb{W}$
 $r x - r \in r \mathbb{W} - \Delta \mathbb{W} \Rightarrow x(r - r) \in r - \Delta \mathbb{W}$
 $x(r - r) \in r - \Delta \mathbb{W} \Rightarrow x \in \frac{r - \Delta \mathbb{W}}{r - r}$
 $D = \left\{ x \mid x = \frac{r k - r}{r k - r}, k \in \mathbb{W} \right\}$