

۱۷، ۲۵

الف) $\sqrt{\frac{x^2-4x}{x^2-x}} \geq 0$ $\frac{x(x-4)}{x(x-1)}$ $\frac{-1}{-} \frac{0}{+} \frac{1}{+} \frac{4}{+}$ $D_f = (-1) \cup [4, +\infty)$ $- \{0\}$

ب) $\sqrt{\frac{x^2-x}{x^2-x}} \geq 0$ $\frac{x(x-1)}{x(x-1)}$ $\frac{-1}{+} \frac{0}{+} \frac{1}{+}$ $D_f = \mathbb{R}$ $1, 7, 5$

الف) $y = \frac{x+1}{\sqrt{x+1}+1}$ $\frac{1}{x+1}$ $D_f = \mathbb{R}^+$

ب) $\frac{1}{\sqrt{x+1}}$ $\frac{+}{+} \frac{+}{+} \frac{-}{+}$ $D_f = \mathbb{R}^+$ $\odot \checkmark$

الف) $y = \sqrt{2-x}$ $D_f = (-\infty, 2]$ خوبه نباشد

ب) $y = \frac{1}{\sqrt{2-x}}$ $D_f = (-\infty, 2)$ $\odot \checkmark$

الف) $y = \sqrt{x - \frac{1}{x}} + \sqrt{x + \frac{1}{x}}$ $\frac{1}{x} \geq 1$ $\frac{1}{x} \geq \frac{1}{x}$ $\frac{1}{x} \geq \frac{1}{x}$ $D_f = [\frac{1}{2}, +\infty)$ $1, 7, 5 \checkmark$

ب) $y = \sqrt{x - \frac{1}{x}} + \sqrt{-x + \frac{1}{x}}$ $\frac{1}{x} \geq 1$ $\frac{1}{x} \geq \frac{1}{x}$ $D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$ $x - \frac{1}{x} \in \mathbb{Z}$ $x \in \mathbb{Z} + \frac{1}{x}$

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

ب) $y = \frac{x}{x \sin x - 1}$ $x \sin x - 1 \neq 0$ $x \sin x \neq 1$ $\sin x \neq \frac{1}{x}$ $\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ $D_f = \mathbb{R} - \{\frac{k\pi}{2} + \frac{\pi}{2}\}$ $\odot \checkmark$

$y = \sqrt{r \sin \alpha - 1}$ $r \sin \alpha - 1 \geq 0$
 $r \sin \alpha \geq 1$
 $\sin \alpha \geq \frac{1}{r}$
 $\alpha \in [r\pi + \frac{\pi}{4}, r\pi + \frac{3\pi}{4}]$ $D_f = \{r\pi + \frac{\pi}{4}, r\pi + \frac{3\pi}{4}, 2r\pi + \frac{\pi}{4}, 2r\pi + \frac{3\pi}{4}, \dots\}$
 $y = \sqrt{\cos \alpha - 1}$ $\cos \alpha - 1 \geq 0$
 $\cos \alpha \geq 1$
 $\alpha \in \{0, 2\pi, 4\pi, \dots\}$ $D_f = \{0, 2\pi, 4\pi, \dots\}$
 ليس من قبيل α في قوسه α فقط α $\{2\pi, 4\pi, \dots\}$

$\cos y = |a| - 3$ $-1 \leq |a| - 3 \leq 1$ $2 \leq |a| \leq 4$
 $D_f = \{a \mid -4 \leq a \leq -2 \text{ or } 2 \leq a \leq 4\}$
 $D_y = [-4, -2] \cup [2, 4]$ I, D
 $y = \arcsin(a^2 + a + 1)$ $-1 \leq a^2 + a + 1 \leq 1$
 $a^2 + a + 1 \leq 1 \Rightarrow a^2 + a \leq 0 \Rightarrow a(a+1) \leq 0 \Rightarrow a \in [-1, 0]$
 $a^2 + a + 1 \geq -1 \Rightarrow a^2 + a + 2 \geq 0 \Rightarrow (a+1)(a+2) \geq 0 \Rightarrow a \in (-\infty, -2] \cup [0, \infty)$
 $D_f = [-1, 0] \cup [0, \infty) = [-1, \infty)$

$y = \sqrt{r \cdot \log(a-r)}$ $a-r > 0 \Rightarrow a > r$
 $r \cdot \log(a-r) \geq 0$ $\log(a-r) \geq 0$ $a-r \geq 1$ $a \geq r+1$
 $D_f = [1, \infty)$
 $y = \log(a-r)$ $a-r > 0$
 $a > r$ $D_f = (-1, 0) \cup (1, \infty)$

$y = \frac{r}{e^x + 1}$ $r+1 \neq 0$ $e^x \neq -1$ $D_f = \mathbb{R}$
 $y = \frac{r}{e^x - 1}$ $e^x \neq 1$ $x \neq \log_e 1$ $D_f = \mathbb{R} - \{\log_e 1\}$
 $y = \frac{r}{e^x - r}$ $r-r \neq 0$ $e^x \neq r$ $x \neq \log_e r$ $D_f = \mathbb{R} - \{\log_e r\}$
 $y = \frac{r}{e^x - r}$ $r-r \neq 0$ $e^x \neq r$ $x \neq \log_e r$ $D_f = \mathbb{R} - \{\log_e r\}$

$y = (x+1)!$ $x+1 \in \mathbb{N}$ $x \in \mathbb{N}-1$ $D_f = \{x \mid x = \frac{k-1}{e}, k \in \mathbb{N}\}$
 $y = \left(\frac{r \cdot a - r}{r \cdot a - a}\right)!$ $\frac{r \cdot a - r}{r \cdot a - a} \in \mathbb{N}$ $r \cdot a - r \in \mathbb{N} \cdot (r \cdot a - a)$ $a \in \frac{-\omega \omega + r}{r - \omega}$
 $a(r - \omega) \in -\omega \omega + r$ $D_f = \{a \mid a = \frac{-\omega k + r}{r - \omega}, k \in \mathbb{N}\}$