

* دوم فصل - مسائل اضافی - تکلیف ص ۹۵

$$\begin{aligned}
 \text{الف) } y &= \sqrt{\frac{x^2 - 4x}{x^3 - x}} & x^2 - 4x > 0 &\rightarrow x(x-4) > 0 & \begin{array}{c} \frac{+}{-} \frac{+}{-} \frac{+}{-} \\ -1 \end{array} \\
 & & x^3 - x > 0 & & (-\infty, 0] \cup [4, +\infty) \\
 & & x(x^2 - 1) > 0 &\rightarrow x(x-1)(x+1) > 0 \\
 & & & \begin{array}{c} \frac{-}{+} \frac{+}{-} \frac{-}{+} \\ -1 \end{array} & (-1, 0) \cup [1, +\infty)
 \end{aligned}$$

$$D_f = (-1, 0) \cup (1, +\infty) \cup (-\infty, 0] \cup [4, +\infty)$$

$$\begin{aligned}
 \text{ب) } y &= \sqrt{\frac{x^3 - x^2}{x^2 - x}} & x^3 - x^2 > 0 & \\
 & & x^2(x-1) > 0 &\rightarrow x \cdot x \cdot (x-1) > 0 \\
 & & & \begin{array}{c} \frac{+}{-} \frac{-}{+} \frac{+}{-} \\ -1 \end{array} & [0, -1] \cup [1, +\infty)
 \end{aligned}$$

$$x^3 - x > 0 \rightarrow x(x^2 - 1) > 0 \rightarrow x(x+1)(x-1) > 0$$

$$\begin{array}{c} \frac{+}{-} \frac{-}{+} \frac{+}{-} \\ -1 \end{array} \quad (0, -1) \cup (1, +\infty)$$

$$D_f = (0, -1) \cup (1, +\infty) \cup [0, -1] \cup [1, +\infty)$$



الف) $y = \frac{x+1}{\sqrt{x+|x|}}$

$x+|x| > 0 \rightarrow |x| > -x \rightarrow D_f = \mathbb{R}^+$

ب) $y = \frac{1}{\sqrt{x|x|}}$

$x|x| > 0 \rightarrow D_f = (0, +\infty)$

الف) $y = \sqrt{2-[x]}$ $2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 3$

$D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-[x]}}$ $2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 3$
 $D_f = (-\infty, 2)$

الف) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]}$

$\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right] \geq 0 \rightarrow \left[x - \frac{1}{x} + 1\right] + \left[x + \frac{1}{x}\right] \geq 0 \rightarrow \left[x - \frac{1}{x}\right] + 1$

$\left[x + \frac{1}{x}\right] \geq 0 \rightarrow 2\left[x - \frac{1}{x}\right] + 1 \geq 0 \rightarrow \left[x - \frac{1}{x}\right] \geq -\frac{1}{2} \rightarrow x - \frac{1}{x} \geq 0$

$D_f = \left[\frac{1}{2}, +\infty\right)$

ب) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[-x + \frac{1}{x}\right]}$



$$الف) y = \frac{r}{\sin x - 1}$$

- 4

$$\sin x - 1 \neq 0 \rightarrow \sin x \neq 1$$



$$D_f = \mathbb{R} - \left\{ K\pi + \frac{\pi}{2} \right\}$$

$$ب) y = \frac{r}{r \sin^2 x - 1}$$

$$r \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{r}$$

$$\sin x \neq \pm \frac{\sqrt{r}}{r}$$

$$D_f = \mathbb{R} - \left\{ K\pi + \frac{\pi}{2} \right\}$$



$$ج) y = \sqrt{r \sin x - 1}$$

- 4

$$r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r}$$

$$D_f = \left[K\pi + \frac{\pi}{2}, K\pi + \frac{3\pi}{2} \right]$$



$$د) y = \sqrt{\cos x - 1}$$

$$\cos x - 1 \geq 0 \rightarrow \cos x \geq 1$$

$$D_f = [K\pi]$$



1. (i) $\cos y = |x| - 3 \quad -1 \leq |x| - 3 \leq 1 \quad -\vee$

2. $2 \leq |x| \leq 4$

3. $\text{Def } [-2, -1] \cup [1, 2]$

4. $y = \sin(x^2 + 3n + 1)$

5. $-1 \leq x^2 + 3n + 1 \leq 1$

6. $x^2 + 3n + 1 \leq 0 \quad x^2 + 3n + 1 \geq 0$

7. $x^2(n+3) \leq 0 \quad \frac{-3}{+1-1+}$ $\rightarrow (n+1)(n+3) \geq 0$

8. $\frac{-3}{+1-1+}$ $\frac{-3}{+1-1+}$

9. $\text{Def } [-3, -1] \cup [-1, 0]$

10. (ii) $y = \sqrt{2 - \log_2(x-2)}$ -11

11. $x > 2 \quad 2 - \log_2(x-2) \geq 0 \rightarrow \log_2(x-2) \leq 2$

12. $x-2 \leq 9 \rightarrow x \leq 11$

13. $\text{Def } (2, 11]$

14. $y = \log(x^2 - n)$

15. $x^2 - n > 0 \quad x(x^2 - 1) \rightarrow x(x-1)(x+1)$

16. $\frac{-1}{-1} \quad \frac{0}{+1} \quad \frac{+1}{-1+}$

17. $\text{Def } [-1, 0] \cup [1, +\infty)$



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$$a) y = \frac{x}{x^n + 1} \rightarrow x^n + 1 \neq 0 \rightarrow x^n \neq -1 \Rightarrow D_f = \mathbb{R}$$

$$b) y = \frac{x}{x^n - 1} \rightarrow x^n - 1 \neq 0 \rightarrow x^n \neq 1 \Rightarrow D_f = \mathbb{R} - \{1\}$$

$$c) y = \frac{x}{x^n - x} \rightarrow x^n - x \neq 0 \rightarrow x^n \neq x \rightarrow x \neq \log_x^r x$$

$$D_f = \mathbb{R} - \{\log_x^r x\}$$

$$d) y = \frac{x}{x^n - x^r} \rightarrow x^n - x^r \neq 0 \rightarrow x^n \neq x^r \rightarrow x \neq \log_x^r x$$

$$D_f = \mathbb{R} - \{\log_x^r x\}$$

10

$$a) y = (x_{n+1})! \rightarrow \{n+1 \in \omega \mid n \in \frac{\omega-1}{2}\}$$

$$D_f = \{K \mid K = \frac{\omega-1}{2}, K \in \omega\}$$

$$b) y = \left(\frac{x^n - x}{x^n - \omega} \right) \rightarrow \frac{x^n - x}{x^n - \omega} \in \omega = \frac{x - \omega}{-x + \omega}$$

$$x \in \frac{-x + \omega}{x - \omega} \Rightarrow D_f = \{K \mid K = \frac{-x + \omega}{x - \omega}, K \in \omega\}$$

