

* دوم فصل - مسائل اضافی - تکالیف ص 40
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$$\frac{n(n-4)}{n(n-1)(n+1)} \quad \text{14, 6}$$

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

$$y = \begin{cases} \frac{n^2 - 4n}{n^3 - n} & n^2 - 4n > 0 \rightarrow n(n-4) \\ \frac{n^3 - n}{n^3 - n} & n^3 - n > 0 \end{cases}$$

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

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

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

$$(-1, 0) \cup (1, +\infty)$$

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

$$y = \sqrt{\frac{n^3 - n^2}{n^3 - n}} \quad n^3 - n^2 \geq 0$$

$$n^2(n-1) \geq 0 \rightarrow n \cdot n \cdot (n-1) \geq 0$$

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

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

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

$$(0, -1) \cup (1, +\infty)$$

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

$$\frac{* -1 \quad * 0 \quad * 1}{+ \quad + \quad + \quad +} \rightarrow D_y = \mathbb{R} - \{-1, 0, 1\}$$

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) $y = \sqrt{2-[x]}$ $2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 3$

$D_f = (-\infty, 3)$

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

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

$x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}, D_f = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

$$الف) y = \frac{r}{\sin x - 1}$$

- 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) $\cos y = |x| - 3 \quad -1 \leq |x| - 3 \leq 1$ -V

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

3. $D_f = [-2, -2] \cup [2, 2]$ ✓

4. $y = \sin(x^2 + x_{n+1})$

5. $-1 \leq x^2 + x_{n+1} \leq 1$

6. $x^2 + x_{n+1} \geq 0$ 1, 1, 1

7. $x^2(x+3) \leq 0$ + - - +

8. $D_f = [-3, -2] \cup [-1, 0]$

9. (ii) $y = \sqrt{x - \log_2(x-2)}$ -A

10. $x > 2 \quad x - \log_2(x-2) \geq 0 \Rightarrow \log_2(x-2) \leq x$

11. $x - 2 \leq 9 \Rightarrow x \leq 11$

12. $D_f = (2, 11]$ ✓

13. $y = \log(x^2 - x)$ 1, 1, 1

14. $x^2 - x > 0 \quad x(x-1) > 0 \Rightarrow x(x-1)(x+1)$

15. - + - +

16. $D_f = (-1, 0) \cup (1, +\infty)$



9

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

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

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

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

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

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

Ⓢ ✓

10

$$a) y = (x_{n+1})! \rightarrow \{n+1 \in \mathbb{N} \mid n \in \frac{\mathbb{N}-1}{x}\}$$

$$D_f = \{K \mid K = \frac{\mathbb{N}-1}{x}, K \in \mathbb{N}\}$$

Ⓢ ✓

$$b) y = \left(\frac{x_{n+1} - x}{x_{n+1} - x} \right) \rightarrow \frac{x_{n+1} - x}{x_{n+1} - x} \in \mathbb{N} = \frac{x - \omega x}{-x + Kx}$$

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

