

12/1/21

19, vx

4. ker

$$y = \sqrt{\frac{x^4 - 9x}{x^2 - x}}$$

$$x(x-9) \Rightarrow 0, 1, 7$$

$$\frac{x^4 - 9x}{x^2 - x} \geq 0$$

$$x(x^3 - 1) \Rightarrow 0, +1, -1$$

x	-1	0	+1	7
y	-	+	+	+

$$D_f = (-1, 0) \cup (0, +1) \cup [7, +\infty)$$

$$y = \sqrt{\frac{x^5 - x^3}{x^3 - x}}$$

$$x^3(x^2 - 1) \Rightarrow 0, +1, -1$$

$$\frac{x^5 - x^3}{x^3 - x} \geq 0$$

$$x(x^2 - 1) \Rightarrow 0, +1, -1$$

x	-1	0	+1
y	+	+	+

$$D_f = \mathbb{R} - \{-1, 0, +1\}$$

-2

$$y = \frac{x+1}{\sqrt{x+|x|}}$$

$$x + |x| > 0$$

$$|x| > -x \Rightarrow \begin{cases} + \checkmark \\ 0 \times \\ - \times \end{cases}$$

$$D_f = \mathbb{R}^+$$

$$y = \frac{1}{\sqrt{x|x|}}$$

$$x|x| > 0 \Rightarrow \begin{cases} + \checkmark \\ 0 \times \\ - \times \end{cases}$$

$$D_f = \mathbb{R}^+$$

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

$D_f : (-\infty, +3)$

۲) ✓

ب) $y = \frac{1}{\sqrt{2 - [x]}}$ $2 - [x] > 0$ $[x] < 2$

$D_f : (-\infty, +2)$

الف) $\sqrt{[x - \frac{1}{3}] + [x + \frac{2}{3}]} \geq 0 \Rightarrow [x - \frac{1}{3}] + [x + \frac{2}{3}] \geq 0 \Rightarrow$

$[x + \frac{2}{3} - 1] + [x + \frac{2}{3}] \geq 0 \Rightarrow [x + \frac{2}{3}] - 1 + [x + \frac{2}{3}] \geq 0 \Rightarrow$

$2[x + \frac{2}{3}] \geq 1 \Rightarrow [x + \frac{2}{3}] \geq \frac{1}{2}$ اوین عدد صحیح بزرگتر از $\frac{1}{2}$ است $\Rightarrow x + \frac{2}{3} \geq 1$

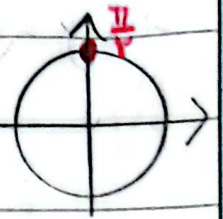
$x \geq \frac{1}{3} \Rightarrow D_f : [\frac{1}{3}, +\infty)$ ۲) ✓

ب) $\sqrt{[x - \frac{1}{3}] + [-x + \frac{1}{3}]} \geq 0 \Rightarrow [x - \frac{1}{3}] + [-x + \frac{1}{3}] \geq 0$

$\begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases} \Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow D_f : \{x | x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

الف) $y = \frac{2}{\sin x - 1}$

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



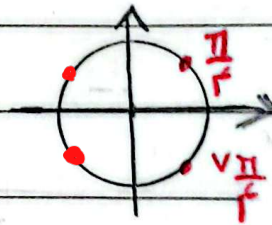
$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$ ✓

ب) $y = \frac{2}{2\sin^2 x - 1}$

$2\sin^2 x - 1 \neq 0 \Rightarrow 2\sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{2}$
 $\Rightarrow \sin x \neq \pm \sqrt{\frac{1}{2}} \Rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$

$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}\}$
 $k\pi \pm \frac{\pi}{4}$

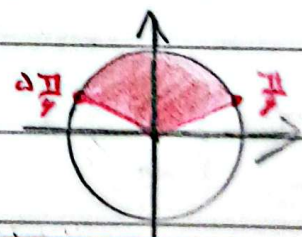
1/√2



الف) $y = \sqrt{2\sin x - 1}$

$2\sin x - 1 \geq 0 \Rightarrow 2\sin x \geq 1$
 $\sin x \geq \frac{1}{2}$

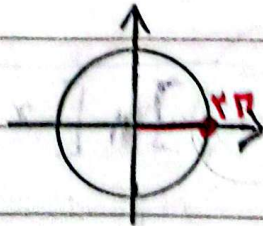
$D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ ✓



ب) $y = \sqrt{2\cos x - 1}$

$2\cos x - 1 \geq 0 \Rightarrow 2\cos x \geq 1$
 $\cos x \geq \frac{1}{2}$

$D_f = \{2k\pi\}$ ✓

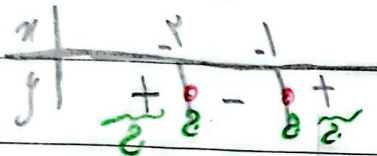


الف $\cos y = |x| - 3$ $-1 \leq |x| - 3 \leq +1$ $+2 \leq |x| \leq +4$ ✓

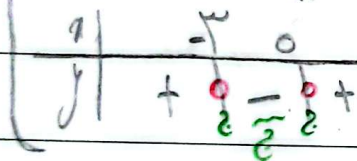
$D_f: [-4, -2] \cup [2, 4]$ (2) ✓

ب $y = \arcsin(x^2 + 3x + 1)$ $-1 \leq x^2 + 3x + 1 \leq +1$

I: $x^2 + 3x + 1 \geq -1$ $x^2 + 3x + 2 \geq 0$ $(x+1)(x+2) \geq 0$



II: $x^2 + 3x + 1 \leq +1$ $x^2 + 3x \leq 0$ $x(x+3) \leq 0$



$D_f: (I) \cup (II) \Rightarrow D_f: [-3, -2] \cup [-1, 0]$

الف $y = \sqrt{2 - \log_3(x-2)}$ $x-2 > 0$ $x > 2$ I

$2 - \log_3(x-2) \geq 0$ $2 \geq \log_3(x-2)$ $x-2 \leq 3^2$ $x-2 \leq 9$ $x \leq 11$ II

$D_f: I \cup II \Rightarrow D_f: [2, 11]$

تجزیه

→ $\log(x^2 - x)$ $x^2 - x > 0$ $x(x-1) > 0$

x	-1	0	$+1$
f	$-$	$+$	$-$

(2) ✓

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

9

$y = \frac{x^2}{f^x + 1} \rightarrow f^x + 1 \neq 0 \rightarrow f^x \neq -1$

معادله برقرار

$D_f: \mathbb{R}$

$y = \frac{x^2}{f^x - 1}$

$f^x - 1 \neq 0$ $f^x \neq 1$ $f^x \neq f^0$ $x \neq 0$

$D_f: \mathbb{R} - \{0\}$

(2) ✓

$y = \frac{x^2}{f^x - 2}$

$f^x - 2 \neq 0$ $f^x \neq 2$

$x \neq \log_f 2$

$D_f: \mathbb{R} - \{\log_f 2\}$

$y = \frac{x^2}{f^x - 3}$

$f^x - 3 \neq 0$ $f^x \neq 3$

$x \neq \log_f 3$

$D_f: \mathbb{R} - \{\log_f 3\}$

مخرجات

-10

$$y = (f(x+1))!$$

$$f(x+1) \in W \quad f(x) \in W-1$$

$$x \in \frac{W-1}{f}$$

$$Df: \{x \mid x = \frac{k-1}{f}, k \in W\}$$

✓

$$y = \left(\frac{\gamma x - \gamma}{\gamma x - a} \right)!$$

$$\frac{\gamma x - \gamma}{\gamma x - a} \in W$$

$$\gamma x - \gamma \in \gamma x W - a W$$

$$\gamma x - \gamma x W \in -a W + \gamma$$

$$x = \frac{\gamma - a W}{\gamma - \gamma W}$$

$$Df: \{x \mid x = \frac{\gamma k - \gamma}{\gamma k - a}, k \in W\}$$