

نیم برانوردنیم $\star$ بار دوم $\star$ A $\star$ نصف ۳

الف) $\frac{x+3}{x^2+3x^2-1x+3}$

$\frac{x+3}{(x-1)(x-1)(x+3)} \neq 0 \quad x \neq -3, \frac{1}{3}$ $D_f: \mathbb{R} - \{-3, \frac{1}{3}\}$ -1

ب) $\frac{x+3}{x^2+9x^2+10x+3}$

$\frac{x+3}{(x+1)(x+1)(x+3)} \neq 0 \quad x \neq -1, -3, -\frac{1}{3}$ $D_f: \mathbb{R} - \{-3, -1, -\frac{1}{3}\}$

الف) $y = \frac{x+3}{x^2-2x^2+2x-1}$

$\frac{x+3}{x^2-2x^2+2x-1} \rightarrow (x-1)(x^2-x+1) \neq 0 \quad x \neq 1$ $D_f: \mathbb{R} - \{1\}$ -2

ب) $y = \sqrt{\frac{x+3}{x^2-2x^2+2x-1}}$

$\sqrt{\frac{x+3}{(x-1)(x^2-x+1)}} \rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0$ $D_f: (-\infty, -1] \cup (1, +\infty)$

$y = \frac{x}{x^2-5x+4}$

$\frac{x}{x^2-5x+4} \rightarrow (x-1)(x-4) \neq 0 \quad x \neq 1, 4$ $D_f: \mathbb{R} - \{1, 4\}$ -3

الف) $y = \sqrt{[x]-2}$

$[x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$ $D_f: (-\infty, -2]$ -4

ب) $y = \frac{2x^2+4}{[x]^2-2[x]-2}$

$([x]-2)([x]+1) \neq 0$
 $[x] \neq 2, [x] \neq -1 \quad x \in [2, 3), [x] \neq -1 \quad x \in [-1, 0)$
 $D_f: \mathbb{R} - ([-1, 0) \cup [2, 3))$

الف) $y = \sqrt{[x-\frac{1}{2}]+[x+\frac{1}{2}]}$

$\sqrt{[x+\frac{1}{2}]+[x-\frac{1}{2}]} \rightarrow \sqrt{2[x+\frac{1}{2}]-1} \geq 0$ -5

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

$\sqrt{[x-\frac{1}{2}]+[-(x+\frac{1}{2})]} \rightarrow \sqrt{[x-\frac{1}{2}]-1} \geq 0$
 $[x-\frac{1}{2}] \geq 1 \rightarrow x \geq \frac{3}{2}$
 $D_f: [\frac{3}{2}, +\infty)$

$y = \sqrt{[x-\frac{1}{2}]+[\frac{1}{2}-x]}$

$\sqrt{[x-\frac{1}{2}]+[-(x+\frac{1}{2})]} \rightarrow \sqrt{[x-\frac{1}{2}]-1} \geq 0$
 $[x-\frac{1}{2}] \geq 1 \rightarrow x \geq \frac{3}{2}$
 $D_f: \{x/n \leq k+\frac{1}{2}, k \in \mathbb{Z}\} \quad x-\frac{1}{2} \in \mathbb{Z} \quad x \in \mathbb{Z}$

الف) $\frac{\cot x+1}{\tan x+1}$

$\sin x, \cos x \neq 0 \quad \tan x \neq -1$ -6

ب) $\sqrt{1-\sin^2 x}$

$\sin^2 x \leq \frac{1}{4} \rightarrow |\sin x| \leq \frac{1}{2}$ $D_f: \mathbb{R} - \{\frac{k\pi}{2}, k\pi - \frac{\pi}{2}\}$

$\sqrt{1-\sin^2 x}$

$D_f: [k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2}]$

الف) $y = \sqrt{r \sin x - 1} \geq 0 \Rightarrow \sin x \geq \frac{1}{r} \quad D_f = \left[r k \pi + \frac{\pi}{6}, r k \pi + \frac{5\pi}{6} \right] \quad -v$
 ب) $y = \sqrt{1 - r \cos x} \geq 0 \Rightarrow \cos x \leq \frac{1}{r} \quad D_f = \left[r k \pi + \frac{\pi}{3}, r k \pi + \frac{5\pi}{3} \right] \quad -v$

الف) $y = \arcsin(x^2 + 2n + 1) \quad -1 \leq x^2 + 2n + 1 \leq 1$
 $x^2 + 2n + 1 \leq 1 \Rightarrow x^2 + 2n \leq 0 \Rightarrow x(n+r) \leq 0$
 $x^2 + 2n + 1 \geq -1 \Rightarrow x^2 + 2n + 2 \geq 0 \Rightarrow (n+1)(x+r) \geq 0$
 $D_f = [-r, -1] \cup [-1, 0]$

ب) $y = \sqrt{a - x^2} \geq 0 \Rightarrow \sqrt{a - x^2} \leq 1 \Rightarrow a - x^2 \leq 1 \Rightarrow -1 \leq x \leq 1$
 $a - x^2 \geq 0 \Rightarrow x^2 \leq a \Rightarrow -\sqrt{a} \leq x \leq \sqrt{a}$
 $D_f = \left[r, \frac{a}{r} \right] \cup \left[r, r/a \right]$

الف) $y = \log_r(1 - \log_r x) \quad x > 0$
 $1 - \log_r x > 0 \Rightarrow \log_r x < 1 \Rightarrow x < r$
 $D_f = (0, r)$

ب) $y = \log_r(1 - \log_r \frac{x}{r}) \quad x > 0$
 $1 - \log_r \frac{x}{r} > 0 \Rightarrow \log_r \frac{x}{r} < 1 \Rightarrow \frac{x}{r} < r \Rightarrow x < r^2$
 $D_f = (0, \frac{1}{r})$

الف) $y = \sqrt{r^{2n+2} - 1} \geq 0 \Rightarrow r^{2n+2} \geq 1 \Rightarrow r^{2n+2} \geq r^2 \Rightarrow 2n+2 \geq 2 \Rightarrow n \geq 0$
 $2n+2 \leq 0 \Rightarrow n \leq -1$
 $D_f = [1, r]$
 ب) $y = \frac{(r^{n+d})}{(r^{n+d})} \quad \frac{r^{n+d}}{r^{n+d}} \in \mathbb{N}$
 $n \leq \frac{r^w - d}{r^w - r}$
 $D_f = \left\{ n \mid n \leq \frac{r^k + d}{r^k - r}, k \in \mathbb{N} \right\}$