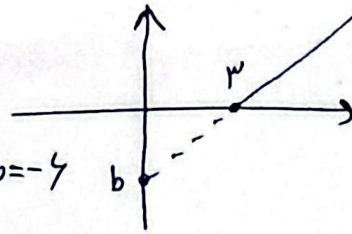


$$f(n) = \sqrt{(a-2)n^2 + an + b}$$

$$\Rightarrow a=2 \Rightarrow 2n+b \Rightarrow 4+b=0 \Rightarrow b=-4$$



-1

$$f(n) = \sqrt{n^2 + 2n + 2 - m^2}$$

همواره مثبت

$$f - 1 + m^2 \leq 0 \Rightarrow f m^2 \leq f \Rightarrow -1 \leq m \leq 1$$

-2

$$1 - (-1) = 2$$

$$f(n) = \sqrt{f - n^2}$$

$$f \geq n^2 \Rightarrow 2 \geq n \geq -2$$

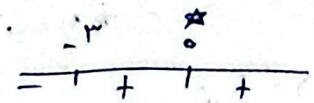
-3

$$[n] + [-n] + 1 \Rightarrow [n] + [-n] + 1 \neq 0 \Rightarrow n \in \mathbb{Z}$$

$$\Rightarrow (-2, -1, 0, 1, 2)$$

اعداد صحیح

$$\text{الف) } y = \sqrt{n^3 + 3n^2} \Rightarrow n^2 + 3n^2 \geq 0 \Rightarrow n^2(n+3) \geq 0$$



-4

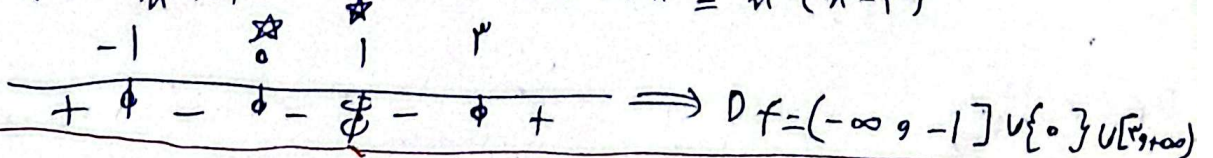
$$Df = [-3, +\infty)$$

$$\text{ب) } y = \sqrt{\frac{(n^2-1)(n^2-3n^2)}{n^3-1}}$$

$$n^2-1 \neq 0 \Rightarrow n \neq \pm 1$$

$$n^2-1 = (n-1)(n+1)$$

$$n^3-3n^2 = n^2(n-3)$$



$$\text{الف) } y = \sqrt{|x-2|-3} \Rightarrow \begin{cases} x-2 \geq 0 \Rightarrow x \geq 2 \\ -x-1 \geq 0 \Rightarrow x \leq -1 \end{cases} \cup \Rightarrow Df = (-\infty, -1] \cup [2, +\infty)$$

$$\text{ب) } y = \sqrt{f - (2-n)} \Rightarrow \begin{cases} 2+n \geq 0 \Rightarrow n \geq -2 \\ 4-n \geq 0 \Rightarrow 4 \geq n \end{cases} \cup \Rightarrow Df = [-2, 4]$$

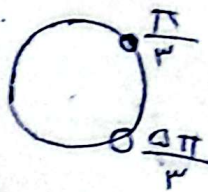
$$\text{الف) } y = \sqrt{1-n|n|} \Rightarrow \begin{cases} n \geq 0 \Rightarrow 1-n^2 \geq 0 \Rightarrow 1 \geq n^2 \Rightarrow 1 \geq n \geq -1 \\ n < 0 \Rightarrow 1+n^2 \geq 0 \Rightarrow n^2 \geq -1 \Rightarrow Df = -\mathbb{R} \end{cases} \cup \Rightarrow Df = (-\infty, 1]$$

همواره برقرار است

-5

$$\text{ب) } y = \frac{1}{\sqrt{3-|n-2|-1}} \wedge \begin{cases} -n > 0 \Rightarrow n < 0 \\ n-2 > 0 \Rightarrow n > 2 \end{cases} \cup \Rightarrow Df = (2, 1) - \{3\} \cup \{V\}$$

الف) $y = \frac{\sin^2 x - 1}{\cos x} \Rightarrow \cos x \neq 0$  $D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2} \right\}$

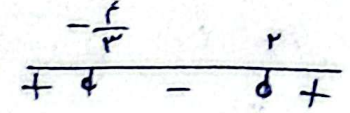
ب) $y = \frac{\cos x}{r \cos x - 1} \Rightarrow \cos x \neq +\frac{1}{r}$  $\Rightarrow D_f = \mathbb{R} - \left\{ rk\pi + \frac{\pi}{r} \right\} - \left\{ rk\pi - \frac{\pi}{r} \right\}$

$D_f = \mathbb{R} - \left\{ rk\pi + \frac{\pi}{r} \right\} - \left\{ rk\pi - \frac{\pi}{r} \right\}$

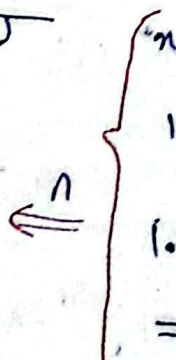
الف) $y = \frac{x+r}{|rx+1| - |x+r|} \Rightarrow |rx+1| \neq |x+r| \xrightarrow{\text{مربع الطرفين}} rx^2 + rx + 1 \neq x^2 + rx + r$

$\Rightarrow rx^2 - rx - 1 \neq 0 \Rightarrow (rx+r)(x-r) \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{ r \right\} - \left\{ -\frac{r}{r} \right\}$

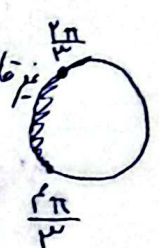
ب) $y = \sqrt{|rx+1| - |x+r|} \Rightarrow |rx+1| \geq |x+r| \xrightarrow{\text{مربع الطرفين}} rx^2 + rx + 1 \geq x^2 + rx + r$

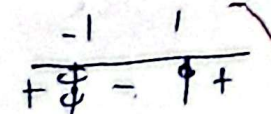
$\Rightarrow rx^2 - rx - 1 \geq 0 \Rightarrow (rx+r)(x-r) \geq 0$ 

$\Rightarrow D_f = (-\infty, -\frac{r}{r}] \cup [r, +\infty)$

$f(x) = \sqrt{\log_{\log_{10}}(rx-1)}$  $D_f = (1, 3]$

$\left\{ \begin{array}{l} x > \frac{1}{r} \\ \log_{\log_{10}}(rx-1) > 0 \Rightarrow rx-1 > 1 \Rightarrow rx > 2 \Rightarrow x > \frac{2}{r} \\ \log_{\log_{10}}(rx-1) \leq 1 \Rightarrow \log_{10}(rx-1) \leq 1 \Rightarrow rx-1 \leq 10 \Rightarrow x \leq \frac{11}{r} \end{array} \right.$

الف) $y = \log(r \cos x + 1) \Rightarrow r \cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{r}$  $\Rightarrow D_f = \mathbb{R} - \left[rk\pi + \frac{\pi}{r}, rk\pi + \frac{\pi}{r} \right]$

ب) $y = \sqrt{\log \frac{x-1}{x+1}}$  $\Rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$

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