

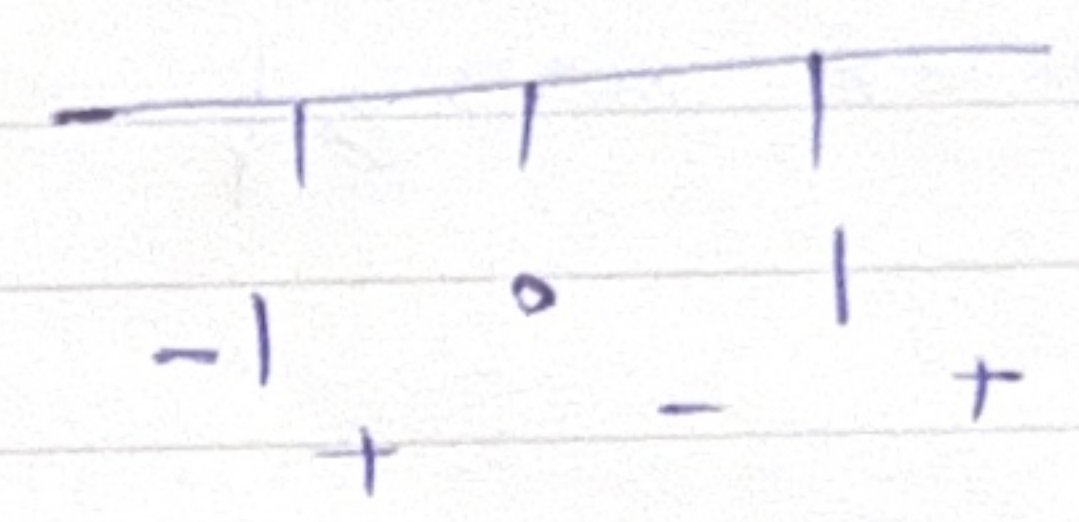
الف) $n^3 - n > 0 \Rightarrow n(n^2 - 1) > 0 \Rightarrow n(n-1)(n+1) > 0 \Rightarrow$

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

ب) $n^3 - n > 0 \Rightarrow n^2 - n < (n^2 - 1) \Rightarrow n(n-1) < (n-1)(n+1)$

$n(n-1)(n+1) > 0 \Rightarrow$

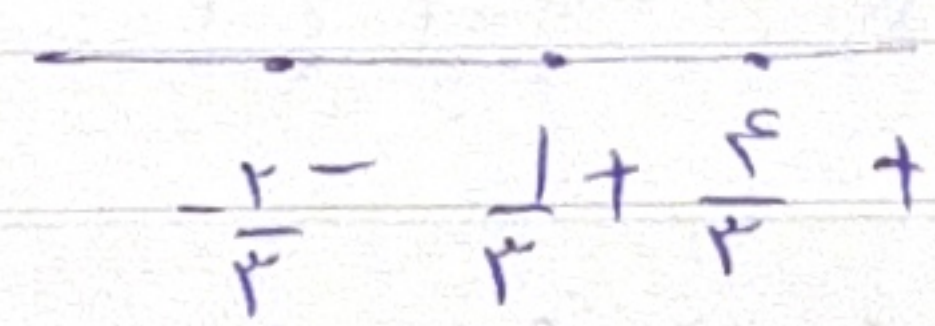
$D_f(-1, 0) \cup (1, +\infty)$



۱) $n + |n| > 0 \Rightarrow D_f(0, +\infty)$

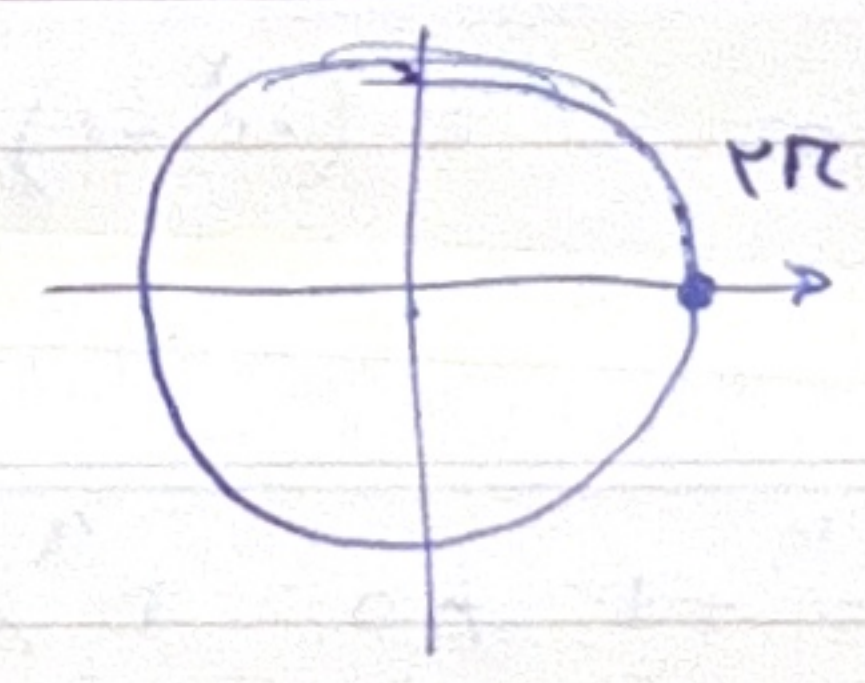
۲) $n \neq 0 \Rightarrow D_f(0, +\infty)$

الف) $-\frac{r}{r} > \frac{1}{r} > \frac{r}{r} \Rightarrow D_f\left[\frac{1}{r}, \infty\right)$

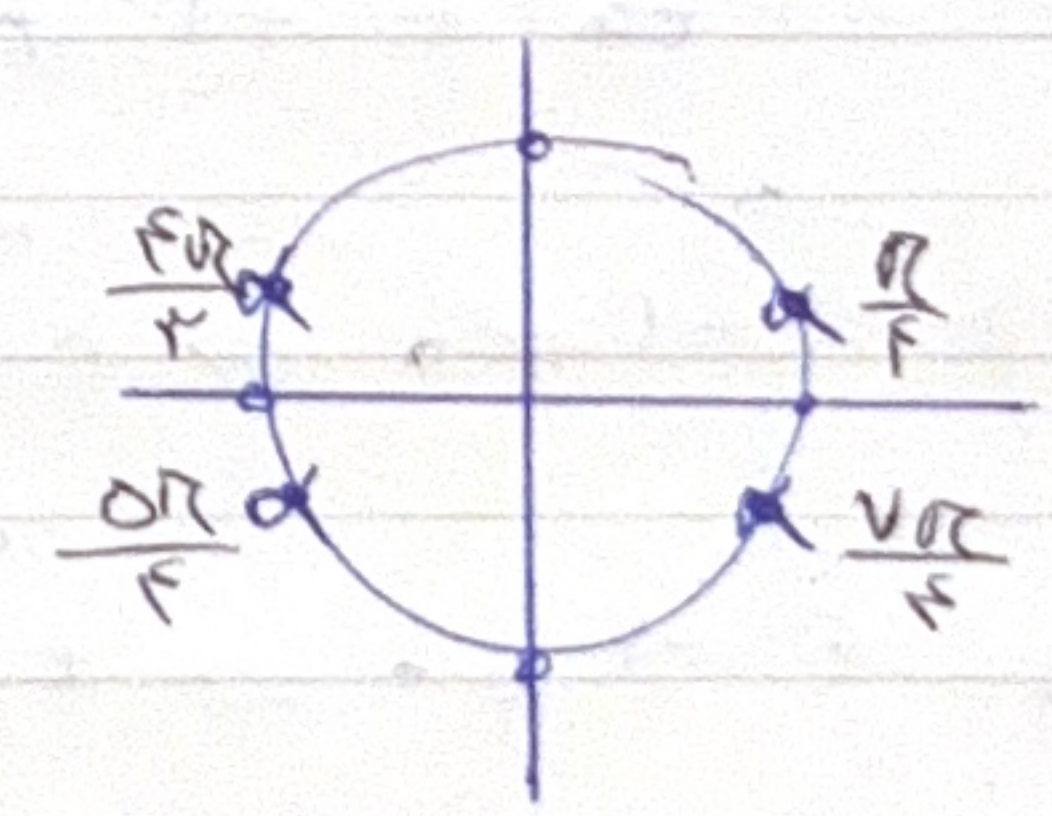


ب)

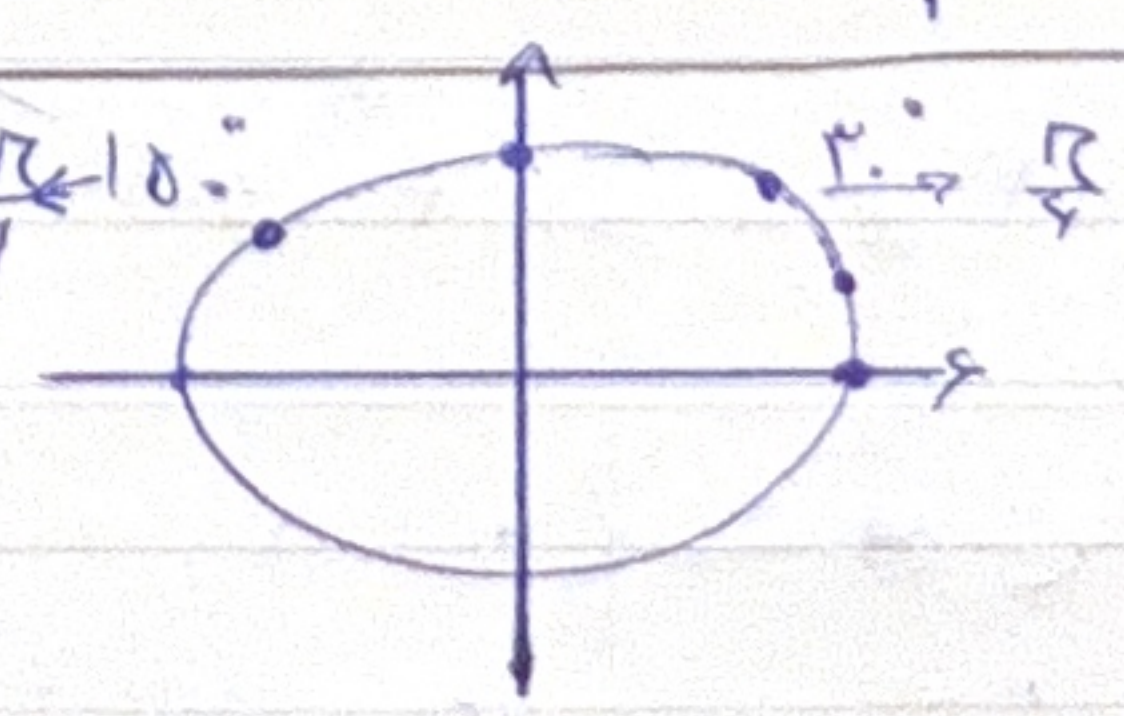
الف) $\cos n - 1 \neq 0 \Rightarrow n \neq 2K\pi$
 $\cos n \neq 1 \Rightarrow D_f \mathbb{R} - \{2K\pi \mid K \in \mathbb{Z}\}$



ب) $\sin^2 n - 1 < 0 \Rightarrow \sin^2 n < 1 \Rightarrow \sin n \neq \pm 1$
 $D_f \left\{ \frac{\pi}{2} + \frac{K\pi}{2} \mid K \in \mathbb{Z} \right\}$



$\sin n \geq \frac{1}{2} \Rightarrow r \sin n - 1 \geq 0 \Rightarrow \sin n \geq \frac{1}{r} \Rightarrow \frac{\pi}{6} \leq n \leq \frac{5\pi}{6}$
 $D_f \left[\frac{\pi}{6} + 2K\pi, \frac{5\pi}{6} + 2K\pi \right]$



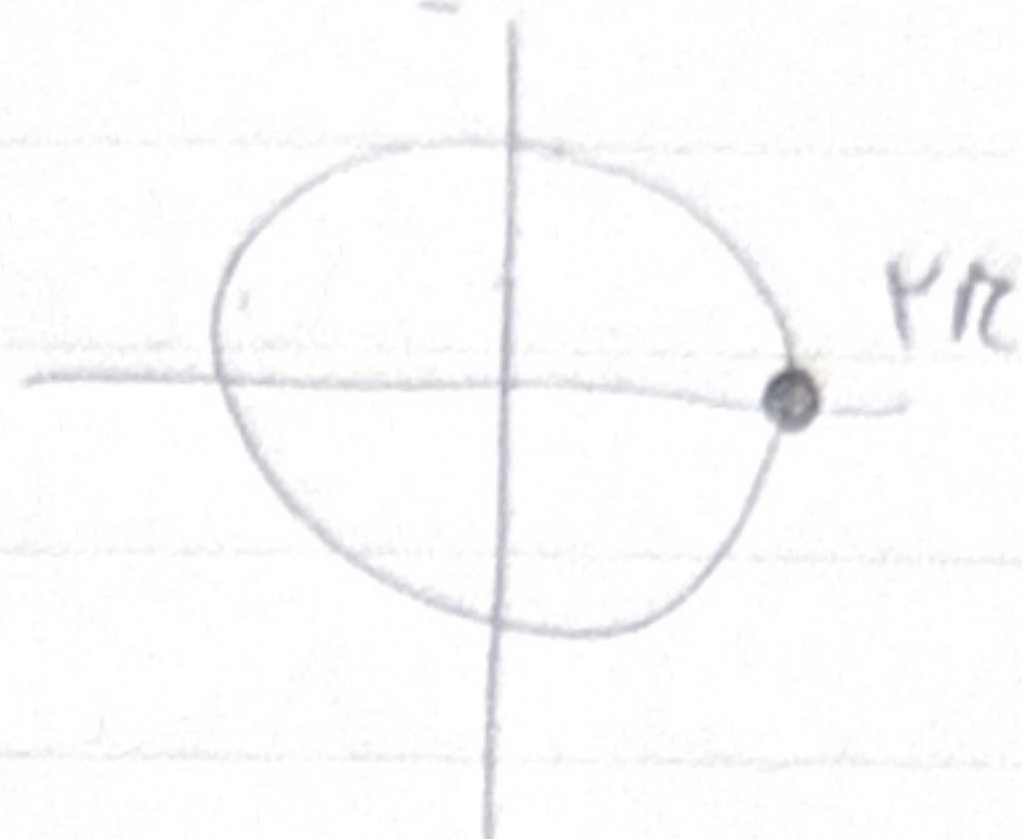
$$\cos m - 1 \geq 0 \Rightarrow \cos m \geq 1$$

$$\cos m = 1 \Rightarrow \cos m = 1$$

(a)

(b)

$$D = \{2k\pi \mid k \in \mathbb{Z}\}$$



$$\text{اذا } y = \sin m \Rightarrow \sin m \geq \frac{1}{2} \quad m \leq \frac{\pi}{4}, \frac{3\pi}{4} \Rightarrow m \in \left[\frac{\pi}{4} + 2k\pi, \frac{3\pi}{4} + 2k\pi \right] \quad (c)$$

$$\text{ب) } \cos m - 1 \geq 0 \Rightarrow \cos m \geq 1 \rightarrow 2k\pi \leq m \rightarrow \{2k\pi \mid k \in \mathbb{Z}\}$$

$$-1 \leq |m| - r \leq 1$$

(d)

$$\text{اذا } r \leq |m| \leq r \Rightarrow m \in [-r, -r] \cup [r, r]$$

$$D = [-r, -r] \cup [-1, 0]$$

$$(n+1)(n+1) \geq 0 \Rightarrow \frac{n}{n-1} \leq -1$$

$$\text{ب) } y = \arcsin(m^r + m^{r+1}) \Rightarrow -1 \leq m^r + m^{r+1} \leq 1 \Rightarrow m^r + m^{r+1} \geq -1 \Rightarrow$$

$$\text{اذا } m - r > 0 \Rightarrow m > r \quad m - r < r^r \quad m - r < 9 \Rightarrow m \leq 11 \quad (r, 11] \quad (e)$$

$$\log(m-r) \leq r$$

$$m \in (-1, 0) \cup (1, \infty)$$

$$\text{ب) } m^r - m > 0 \quad m(m^r - 1) > 0 \quad m(m-1)(m+1) > 0 \Rightarrow m > 0$$

$$\text{اذا } \Rightarrow f^m + 1 \neq 0 \quad f^m > 0 \Rightarrow D = \mathbb{R}$$

(f)

$$\text{ب) } f - 1 \neq 0 \Rightarrow f \neq 1 \Rightarrow f \leq 1 \Rightarrow m \neq 0$$

$$\text{ج) } f - r \neq 0 \Rightarrow f \neq r \Rightarrow m \neq \log_r f \quad f^{\frac{1}{r}}, r \quad m \neq \frac{1}{r}$$

$$\text{د) } f - r \neq 0 \Rightarrow f \neq r \quad m \neq \log_f r$$

$$\text{اذا } f_{n+1} \in \mathbb{N} \rightarrow \{0, 1, 2, \dots\} \rightarrow f_{n+1} \leq n$$

$$f_m = n-1 \Rightarrow m \leq \frac{n-1}{f} \Rightarrow \left\{ -\frac{1}{f}, 0, \frac{1}{f}, \frac{2}{f}, \dots \right\}$$

(g)

$$\text{ب) } \frac{r_m - r}{r_m - a} \Rightarrow r_m - r \leq n(r_m - a) \Rightarrow (r - r_m)m \leq r - am \Rightarrow \frac{r - am}{r - r_m}$$