

نام دنام خاندان فرشته شده است نقشه مفرصا می باشد (۱۵)

الف) $y = \sqrt{\left[n - \frac{1}{4}\right] + \left[n + \frac{1}{4}\right]} \rightarrow \left[n - \frac{1}{4}\right] + \left[n + \frac{1}{4}\right] + 1 \geq 0$ سوال آتای آیدد + 1 شده است!

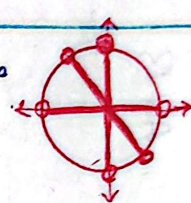
$2\left[n + \frac{1}{4}\right] \geq 1 \rightarrow \left[n + \frac{1}{4}\right] \geq \frac{1}{4} \rightarrow n + \frac{1}{4} \geq \frac{1}{4} \rightarrow n \geq -\frac{1}{4} \rightarrow D_f = \left[-\frac{1}{4}, +\infty\right)$

ب) $y = \sqrt{\left[n - \frac{1}{4}\right] + \left[\frac{1}{4} - n\right]} \rightarrow \left[n - \frac{1}{4}\right] + \left[-n + \frac{1}{4}\right] \geq 0 \rightarrow$
 $\begin{cases} [-n] + [n] \geq 0 \\ \text{if } n \in \mathbb{Z} \rightarrow 0 \checkmark \\ [-n] + [n] \geq 0 \\ \text{if } n \notin \mathbb{Z} \rightarrow -1 \times \end{cases}$

$\left[n - \frac{1}{4}\right] \in \mathbb{Z} \rightarrow n - \frac{1}{4} \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{4}$

$D_f = \left\{n \mid n = k + \frac{1}{4}, k \in \mathbb{Z}\right\}$ (۱۶)

الف) $y = \frac{\cot n + 1}{\tan n + 1}$
 $\frac{\cos n}{\sin n} + 1 \rightarrow \tan n \neq -1$

 $\cos n \neq 0, \sin n \neq 0$
  (۱۷)

$\rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{3\pi}{4}, k\pi, k\pi + \frac{\pi}{4}\right\}$

ب) $y = \sqrt{1 - 4\sin^2 n} \rightarrow 1 - 4\sin^2 n \geq 0 \rightarrow 4\sin^2 n \leq 1$
 $\sin^2 n \leq \frac{1}{4}$

$D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}\right]$
 $-\frac{\sqrt{1}}{2} \leq \sin n \leq \frac{\sqrt{1}}{2}$

الف) $y = \sqrt{3\sin n - 1} \rightarrow 3\sin n - 1 \geq 0 \rightarrow \sin n \geq \frac{1}{3} \rightarrow D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\right]$ (۱۸)

ب) $y = \sqrt{1 - 2\cos n} \rightarrow 1 - 2\cos n \geq 0 \rightarrow \cos n \leq \frac{1}{2}$
 $2k\pi + \frac{\pi}{3}$

 $\rightarrow D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\right]$

الف) $y = \arcsin(n^2 + 3n + 1) \rightarrow -1 \leq n^2 + 3n + 1 \leq 1 + \frac{9}{4}$ (۱۹)

$\frac{1}{4} \leq n^2 + 3n + \frac{9}{4} \leq \frac{9}{4}$

$\frac{1}{4} \leq \left(n + \frac{3}{2}\right)^2 \leq \frac{9}{4}$

$n + \frac{3}{2} \leq \frac{3}{2} \rightarrow n \leq 0$
 $-\frac{3}{2} \leq n + \frac{3}{2} \rightarrow n \geq -3$
 $[0, -3]$

$D_f = [-3, -2] \cup [-1, 0]$
 $\left[\begin{array}{l} n + \frac{3}{2} \geq \frac{1}{2} \\ \rightarrow n \geq -1 \\ n + \frac{3}{2} \leq -\frac{1}{2} \\ \rightarrow n \leq -2 \end{array} \right]$

(الف) $y = \sqrt{\left[n - \frac{1}{r}\right] + \left[n + \frac{r}{r}\right]} \rightarrow \left[n - \frac{1}{r}\right] + \left[n + \frac{r}{r}\right] + 1 \geq 0 + 1$

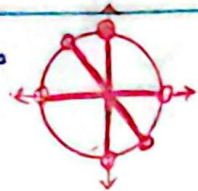
$2\left[n + \frac{r}{r}\right] \geq 1 \rightarrow \left[n + \frac{r}{r}\right] \geq \frac{1}{2} \rightarrow n + \frac{r}{r} \geq \frac{1}{2} \rightarrow n \geq \frac{1}{2} - \frac{r}{r} \rightarrow D_f = \left[\frac{1}{2}, +\infty\right)$

(ب) $y = \sqrt{\left[n - \frac{1}{r}\right] + \left[\frac{1}{r} - n\right]} \rightarrow \left[n - \frac{1}{r}\right] + \left[-n + \frac{1}{r}\right] \geq 0 \rightarrow \begin{cases} [-n] + [n] \geq 0 \\ \text{if } n \in \mathbb{Z} \rightarrow 0 \checkmark \\ [-n] + [n] \geq 0 \\ \text{if } n \in \mathbb{Z} \rightarrow -1 \times \end{cases}$

$\left[n - \frac{1}{r}\right] \in \mathbb{Z} \rightarrow n - \frac{1}{r} \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{r}$

$D_f = \left\{ n \mid n = k + \frac{1}{r}, k \in \mathbb{Z} \right\}$

(الف) $y = \frac{\cot n + 1}{\tan n + 1} \xrightarrow{\frac{\cos n}{\sin n} + 1} \tan n \neq -1, \cos n \neq 0, \sin n \neq 0$
 $\rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi, k\pi + \frac{3\pi}{4} \right\}$



(ب) $y = \sqrt{1 - r \sin^2 n} \rightarrow 1 - r \sin^2 n \geq 0 \rightarrow r \sin^2 n \leq 1$
 $\sin^2 n \leq \frac{1}{r}$

$D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right] \leftarrow -\frac{\sqrt{r}}{r} \leq \sin n \leq \frac{\sqrt{r}}{r}$

(الف) $y = \sqrt{r \sin n - 1} \rightarrow r \sin n - 1 \geq 0 \rightarrow \sin n \geq \frac{1}{r} \rightarrow D_f = \left[r k\pi + \frac{\pi}{4}, r k\pi + \frac{3\pi}{4} \right] \checkmark$

(ب) $y = \sqrt{1 - r \cos n} \rightarrow 1 - r \cos n \geq 0 \rightarrow \cos n \leq \frac{1}{r}$
 $\rightarrow D_f = \left[r k\pi + \frac{\pi}{r}, r k\pi + \frac{2\pi}{r} \right]$

(الف) $y = \arcsin(r^2 + r n + 1) \xrightarrow{\frac{a}{r} + 1} \frac{a}{r} + 1 \leq r^2 + r n + 1 \leq 1 + \frac{a}{r}$

$\frac{1}{r} \leq r^2 + r n + \frac{a}{r} \leq \frac{a}{r}$

$\frac{1}{r} \leq \left(n + \frac{r}{r}\right)^2 \leq \frac{a}{r}$

$n + \frac{r}{r} \leq \frac{\sqrt{a}}{r} \rightarrow n \leq 0$
 $\frac{\sqrt{a}}{r} \leq n + \frac{r}{r} \rightarrow n \geq -\sqrt{a}$

$\downarrow$
 $[0, -\sqrt{a}]$

$D_f = [-\sqrt{a}, -r] \cup [-1, 0]$

$n + \frac{r}{r} \geq \frac{1}{r}$

$\rightarrow n \geq -1$

$n + \frac{r}{r} \leq \frac{-1}{r}$

$\rightarrow n \leq -r$

ب) $\cos y = \sqrt{\omega - 2m}$

$\rightarrow -1 \leq \sqrt{\omega - 2m} \leq 1 \rightarrow 0 \leq \omega - 2m \leq 1$
 $- \omega \leq -2m \leq -1$

د) $D_f = 2 \leq m \leq \omega \leftarrow \omega \geq m \geq 2$

الف) $y = \log_r(1 - \log_r^n)$

$\rightarrow 1 - \log_r^n > 0 \rightarrow \log_r^n < 1$

$\rightarrow n < r, n > 0 \rightarrow D_f = (0, r)$

ب) $y = \log_r(1 - \log_{\frac{1}{r}}^n)$

$\rightarrow 1 - \log_{\frac{1}{r}}^n > 0 \xrightarrow{\text{علامت عوض می‌شود}} \log_{\frac{1}{r}}^n < 1$

$n > \frac{1}{r}, n > 0 \rightarrow D_f = (\frac{1}{r}, +\infty)$

الف) $y = \sqrt{r^{2m-2n} - 1}$

$\rightarrow r^3(r^{-2n+2m-2} - 1) \geq 0$

$\Rightarrow -2n + 2m - 2 = 0 \rightarrow n = 1, 3 \rightarrow \frac{1}{-2+2}$

$D_f = [1, 3]$

ب) $y = \left(\frac{r^n + \omega}{r^n + \varepsilon}\right)!$

$\rightarrow \frac{r^n + \omega}{r^n + \varepsilon} \in \mathbb{N} \rightarrow - \frac{r\omega - \omega}{r\omega - r}$

$D_f = \{n \mid n = \frac{\omega - r\varepsilon}{r\varepsilon - r}, r\varepsilon \in \mathbb{N}\}$

همه ضرایب عبارت صفر است پس عبارت بر $x-1$ بخش پذیر است

$$\begin{array}{r|l} 2x^3 + 3x^2 - 1x + 3 & x-1 \\ -2x^3 + 2x^2 & \\ \hline 5x^2 - 1x + 3 & \\ -5x^2 + 5x & \\ \hline -4x + 3 & \\ -4x + 4 & \\ \hline -1 & \end{array}$$

$$\rightarrow (x-1)(2x^2 + 5x - 4) \neq 0$$

ریشه های عبارت را بدست می آوریم

$$\begin{cases} x-1=0 \rightarrow x=1 \\ 2x^2 + 5x - 4 = 0 \rightarrow x = \frac{-5 \pm \sqrt{49}}{4} \rightarrow x = \frac{1}{2} \text{ و } -4 \end{cases}$$

$$D_f = \mathbb{R} - \left\{ -4, \frac{1}{2}, 1 \right\}$$

ج.ب.ا

همه ضرایب توان های زوج با ضرایب توان های فرد برابر است پس عبارت بر $x+1$ بخش پذیر است.

$$\begin{array}{r|l} 2x^3 + 9x^2 + 10x + 3 & x+1 \\ -2x^3 + 2x^2 & \\ \hline 7x^2 + 10x + 3 & \\ -7x^2 + 7x & \\ \hline 17x + 3 & \\ -17x - 17 & \\ \hline 20 & \end{array}$$

$$\rightarrow (x+1)(2x^2 + 7x + 3)$$

ریشه های عبارت را بدست می آوریم

$$\begin{cases} x+1=0 \rightarrow x=-1 \\ 2x^2 + 7x + 3 = 0 \rightarrow x = \frac{-7 \pm \sqrt{49}}{4} \rightarrow x = -3 \text{ و } -\frac{1}{2} \end{cases}$$

$$D_f = \mathbb{R} - \left\{ -3, -1, -\frac{1}{2} \right\}$$

$$۲- (الف) \quad x^3 - 2x^2 + 2x - 1 = 0 \xrightarrow[\text{نقش پذیر بر } x-1]{\text{مجموع ضرایب صفر است}} (x-1)(x^2 - x + 1) = 0$$

$$\begin{cases} x-1=0 \rightarrow x=1 \\ x^2-x+1=0 \end{cases}$$

ریشه حقیقی ندارد $\Delta < 0$

$$\rightarrow D_f = \mathbb{R} - \{1\}$$

$$۲- (ب) \quad \frac{x+3}{x^3 - 2x^2 + 2x - 1} \geq 0 \rightarrow \frac{x+3}{(x-1)(x^2 - x + 1)} \geq 0$$

صاحب ضرایب صفر است (نقش پذیر بر $x-1$)

ریشه ندارد! $\Delta < 0$

$$\frac{-3}{+} \quad \frac{1}{-} \quad \frac{1}{+} \quad \rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$$

۳- کم عبارت مخرج را دستکاری می کنیم تا کساده برسد...

$$(x^2 - 2x + 1) - \omega |x-1| + 4 \rightarrow (x-1)^2 - \omega |x-1| + 4 \xrightarrow{|x-1|=t} t^2 - \omega t + 4$$

$$(t-1)(t-4) = 0 \rightarrow t=1, t=4$$

$$\rightarrow D_f = \mathbb{R} - \{-3, 0, 2, \omega\}$$

$$|x-1|=1 \rightarrow x=2, 0 \quad |x-1|=4 \rightarrow x=5, -3$$

$$۴- (الف) \quad [-n] - 2 \geq 0 \rightarrow [-n] \geq 2 \rightarrow -n \geq 2 \rightarrow n \leq -2 \rightarrow D_f = (-\infty, -2]$$

$$۴- (ب) \quad [n]^2 - 2[n] - 3 = 0 \xrightarrow{[n]=t} t^2 - 2t - 3 = 0 \rightarrow (t-3)(t+1) = 0$$

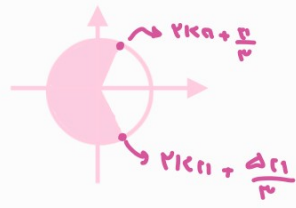
$$t=3 \rightarrow [n]=3 \rightarrow n \in [3, 4)$$

$$t=-1 \rightarrow [n]=-1 \rightarrow n \in [-1, 0)$$

$$\rightarrow D_f = (-\infty, -1) \cup [3, 4) \cup [4, +\infty)$$

$$\mathbb{R} - \left\{ \frac{1}{2} [3, 4) \cup [4, 5) \right\}$$

$v - \frac{1}{r} \quad | -rc \cdot \sin \geq \cdot \rightarrow c \sin \leq \frac{1}{r}$



$\rightarrow D_{\mathbb{D}} \left[r(kn + \frac{\pi}{r}), r(kn + \frac{2\pi}{r}) \right]$