

الف) $\frac{x+3}{x^2+x^2-1x+3}$ $\frac{x^2+x^2-1x+3}{x^2+x^2}$ $\left \frac{x+1}{x^2+x^2+3} \right$ $\frac{x^2+x^2-1x+3}{x^2+x^2}$ $\left\{ \begin{array}{l} x^2+x^2-1x+3 \\ x^2+x^2 \end{array} \right\}$ $\frac{x^2+x^2-1x+3}{x^2+x^2}$ $\left\{ \begin{array}{l} x^2+x^2-1x+3 \\ x^2+x^2 \end{array} \right\}$	جمع ضرایب قدر - ضرایب درجه ۱ - ۱ $\frac{x-1}{x^2+x^2-1x+3}$ $\frac{x-1}{x^2+x^2-1x+3} \rightarrow x^2+x^2-1x+3=0 \rightarrow (x-1)(x+4)=0$ $x = \frac{1}{4}, x = -\frac{1}{4}, -3$ $x^2+x^2-1x+3 \neq 0 \rightarrow x \neq 1, \frac{1}{4}, -3 \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{4}, -3\}$ ب) $y = \frac{x+3}{x^2+x^2-1x+3}$ (۱) $\frac{x+3}{x^2+x^2-1x+3} \rightarrow x^2+x^2-1x+3=0 \rightarrow (x-1)(x+4)=0$ $x = -\frac{1}{4}, -3 \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{4}, -3\}$	۱
الف) $y = \frac{x+3}{x^2+x^2-1x+3}$ $\frac{x+3}{x^2+x^2-1x+3} \rightarrow x^2+x^2-1x+3=0 \rightarrow (x-1)(x+4)=0$ $x = -\frac{1}{4}, -3 \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{4}, -3\}$	جمع ضرایب قدر - ضرایب درجه ۱ - ۱ $\frac{x-1}{x^2+x^2-1x+3}$ $\frac{x-1}{x^2+x^2-1x+3} \rightarrow x^2+x^2-1x+3=0 \rightarrow (x-1)(x+4)=0$ $x = -\frac{1}{4}, -3 \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{4}, -3\}$	۲
$y = \frac{x}{x^2-\omega x-1 -2n+\omega}$ $\rightarrow x^2-\omega x-1 -2n+\omega \neq 0 \rightarrow x^2-\omega x+\omega-2n+\omega \neq 0$ $x^2-\omega x+\omega-2n+\omega \neq 0 \rightarrow (x-2)(x-\omega) \begin{cases} x=2 \\ x=\omega \end{cases}$ $x^2+\omega x-\omega-2n+\omega \neq 0$ $x^2+3n \neq 0 \rightarrow n(n+3) \begin{cases} n=0 \\ n=-3 \end{cases}$ $D_f = \mathbb{R} - \{2, \omega, 0, -3\}$	$\frac{x}{x^2-\omega x-1 -2n+\omega}$ $\rightarrow x^2-\omega x-1 -2n+\omega \neq 0 \rightarrow x^2-\omega x+\omega-2n+\omega \neq 0$ $x^2-\omega x+\omega-2n+\omega \neq 0 \rightarrow (x-2)(x-\omega) \begin{cases} x=2 \\ x=\omega \end{cases}$ $x^2+\omega x-\omega-2n+\omega \neq 0$ $x^2+3n \neq 0 \rightarrow n(n+3) \begin{cases} n=0 \\ n=-3 \end{cases}$ $D_f = \mathbb{R} - \{2, \omega, 0, -3\}$	۳
الف) $y = \frac{x+3}{ 2n+1 - n+3 }$ $\rightarrow 2n+1 - n+3 \neq 0 \rightarrow 2n+1 \neq n+3 \xrightarrow{\text{مربع}} 4n^2+4n+1 \neq n^2+6n+9$ $\rightarrow 3n^2-2n-8 \neq 0 \xrightarrow{\text{مربع}} 3n^2-2n-8 \neq 0 \rightarrow (n-4)(n+2) \neq 0$ $n=4, n=-2$ ب) $\sqrt{ 2n+1 - n+3 } \rightarrow 2n+1 - n+3 > 0$ $2n+1 > n+3 \xrightarrow{\text{مربع}} 4n^2+4n+1 > n^2+6n+9 \rightarrow 3n^2-2n-8 > 0$ $\rightarrow (n-4)(n+2) > 0 \begin{cases} n=4 \\ n=-2 \end{cases}$ $D_f = \mathbb{R} - \{4, -2\}$	$\frac{x+3}{ 2n+1 - n+3 }$ $\rightarrow 2n+1 - n+3 \neq 0 \rightarrow 2n+1 \neq n+3 \xrightarrow{\text{مربع}} 4n^2+4n+1 \neq n^2+6n+9$ $\rightarrow 3n^2-2n-8 \neq 0 \xrightarrow{\text{مربع}} 3n^2-2n-8 \neq 0 \rightarrow (n-4)(n+2) \neq 0$ $n=4, n=-2$ ب) $\sqrt{ 2n+1 - n+3 } \rightarrow 2n+1 - n+3 > 0$ $2n+1 > n+3 \xrightarrow{\text{مربع}} 4n^2+4n+1 > n^2+6n+9 \rightarrow 3n^2-2n-8 > 0$ $\rightarrow (n-4)(n+2) > 0 \begin{cases} n=4 \\ n=-2 \end{cases}$ $D_f = \mathbb{R} - \{4, -2\}$	۴
الف) $y = \log_r(1-\log_r^n)$ $\rightarrow 1-\log_r^n > 0 \rightarrow \log_r^n < 1 \rightarrow n < \frac{1}{r}$ $n > 0$ ب) $y = \log_r(1-\log_r^{\frac{1}{r}})$ $\rightarrow 1-\log_r^{\frac{1}{r}} > 0 \rightarrow \log_r^{\frac{1}{r}} < 1 \rightarrow n > \frac{1}{r}$ $n > 0$	$\log_r^n < 1 \rightarrow n < \frac{1}{r}$ $n > 0$ $\log_r^{\frac{1}{r}} < 1 \rightarrow n > \frac{1}{r}$ $n > 0$	۵

$$f(n) = \sqrt{\log_{10} \log_{10}^{(n-1)}} \rightarrow \log_{10} \log_{10}^{(n-1)} > 0 \rightarrow \log_{10}^{(n-1)} > 1 \rightarrow n-1 > 1 \rightarrow n > 2 \Rightarrow n > 1 \quad \text{I}$$

$$\log_{10} \log_{10}^{(n-1)} > 0 \rightarrow \log_{10}^{(n-1)} > 0 \rightarrow n-1 > 0 \rightarrow n > 1 \rightarrow n > \frac{1}{1} \quad \text{II}$$

$$\log_{10}^{(n-1)} \leq 1 \rightarrow n-1 \leq 10 \rightarrow n \leq 11 \rightarrow n \leq 12 \quad \text{III}$$

$$\text{I} \cap \text{II} \cap \text{III} \rightarrow D_f = (1, 12]$$

و) $y = \log(r \cos n + 1) \rightarrow r \cos n + 1 > 0 \rightarrow r \cos n > -1 \rightarrow \cos n > -\frac{1}{r}$

$$D_f = (r\pi - \frac{\pi}{r}, r\pi + \frac{\pi}{r})$$

ب) $y = \sqrt{\log \frac{n-1}{n+1}} \rightarrow \log \frac{n-1}{n+1} > 0 \rightarrow \frac{n-1}{n+1} > 1 \rightarrow \frac{n-1}{n+1} - 1 > 0 \rightarrow \frac{n-1-n-1}{n+1} > 0 \Rightarrow \frac{-2}{n+1} > 0$

$$\frac{-2}{n+1} > 0 \rightarrow \frac{-1}{n+1} > 0 \rightarrow (-\infty, -1) \cup (1, +\infty) \quad \text{II}$$

$$\frac{-1}{n+1} > 0 \rightarrow n < -1 \quad \text{I}$$

$$\text{I} \cap \text{II} \rightarrow D_f = (-\infty, -1)$$

$f(n) = \sqrt{(a+r)x^2 + an + b}$ $\xrightarrow{\text{بداية زير الجذر}} a+r=0 \rightarrow a=-r$

$D_f = \mathbb{R}$

$$an+b > 0 \rightarrow -rn+b > 0 \xrightarrow{x=r} -r(r)+b=0$$

$$b = -4$$

$f(n) = \sqrt{x^2 + rx + r - m^2} \rightarrow x^2 + rx + r - m^2 > 0$ $\Delta = b^2 - 4ac = r^2 - 4(r-m^2) = r^2 - 4r + 4m^2 = 0 \Rightarrow -r + 4m^2 = 0 \Rightarrow 4m^2 = r \Rightarrow m^2 = \frac{r}{4} \Rightarrow m = \pm \frac{\sqrt{r}}{2}$

$\Delta = b^2 - 4ac = r^2 - 4(r-m^2) = r^2 - 4r + 4m^2 = 0 \Rightarrow -r + 4m^2 = 0 \Rightarrow 4m^2 = r \Rightarrow m^2 = \frac{r}{4} \Rightarrow m = \pm \frac{\sqrt{r}}{2}$

$r = m^2$ $\Rightarrow m = \pm 1$

$r = m^2$ $\Rightarrow m = \pm 1$

$f(n) = \frac{\sqrt{r-n^2}}{[n] + [-n] + 1}$

$$r-n^2 > 0 \rightarrow n^2 < r \rightarrow -\sqrt{r} < n < \sqrt{r} \quad \text{I}$$

$$[n] + [-n] + 1 \neq 0 \rightarrow [n] + [-n] \neq -1 \rightarrow n \in \mathbb{Z} \quad \text{II}$$

$$\text{I} \cap \text{II} \rightarrow D_f = \{-\sqrt{r}, -1, 0, 1, \sqrt{r}\} \rightarrow \text{عدد صحيح}$$