

۲. آزمون

الف) $y = \sqrt{\frac{n^2-4n}{n^2-n}}$ $n^2-4n = n(n-4) = 0 \Rightarrow n = 0, 4$ $n^2-n = n(n+1)(n-1) = 0 \Rightarrow n = 0, \pm 1$ $\frac{-1 \ 0 \ 1 \ 4}{+ \ + \ + \ - \ +}$ $\frac{n^2-4n}{n^2-n} \geq 0$ $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$ Ⓟ ✓	ب) $y = \sqrt{\frac{n^2-n^3}{n^2-n}}$ $\frac{n^2-n^3}{n^2-n} \geq 0$ $n^2-n^3 = n^2(n-1) = n^2(n+1)(n-1) = 0 \Rightarrow n = 0, \pm 1$ $n^2-n = n(n^2-1) = n(n+1)(n-1) = 0 \Rightarrow n = 0, \pm 1$ $\frac{-1 \ 0 \ 1 \ 1}{+ \ + \ + \ - \ +}$ $D_f = \mathbb{R} - \{0, \pm 1\}$ ۱
الف) $y = \frac{n+1}{\sqrt{n+ n }}$ $n+ n > 0$ $\begin{cases} n > 0 & n+ n > 0 \\ n < 0 & n+ n = 0 \\ n = 0 & n+ n = 0 \end{cases}$ $D_f = \mathbb{R}^+ \cup (0, +\infty)$ Ⓟ ✓	ب) $y = \frac{1}{\sqrt{n n }}$ $n n > 0$ $\begin{cases} n > 0 & n n > 0 \\ n < 0 & n n = 0 \\ n = 0 & n n = 0 \end{cases}$ $D_f = \mathbb{R}^+ \cup (0, +\infty)$ ۲
الف) $y = \sqrt{2-[n]}$ $2-[n] \geq 0$ $[n] \leq 2 \Rightarrow n \leq 2 \Rightarrow D_f = (-\infty, 2]$ Ⓟ ✓	ب) $\frac{1}{\sqrt{2-[n]}}$ $2-[n] > 0$ $[n] < 2$ $n < 2$ $D_f = (-\infty, 2)$ ۳
الف) $y = \sqrt{[n-\frac{1}{n}] + [n+\frac{1}{n}]}$ $[n-\frac{1}{n}] + [n+\frac{1}{n}] \geq 0$ $[n+\frac{1}{n}-1] + [n+\frac{1}{n}]$ $[n+\frac{1}{n}] + [n+\frac{1}{n}] - 1 \geq 0 \Rightarrow 2[n+\frac{1}{n}] \geq 1$ $[n+\frac{1}{n}] \geq \frac{1}{2} \Rightarrow n+\frac{1}{n} \geq \frac{1}{2} \Rightarrow n \geq \frac{1}{2}$ $D_f = [\frac{1}{2}, +\infty)$ Ⓟ ✓	ب) $y = \sqrt{[n-\frac{1}{n}] + [-n+\frac{1}{n}]}$ $[n-\frac{1}{n}] + [-n+\frac{1}{n}] \geq 0$ $-(n-\frac{1}{n}) = -n+\frac{1}{n} \Rightarrow \sqrt{[n-\frac{1}{n}] + [-(n-\frac{1}{n})]}$ $n-\frac{1}{n} \in \mathbb{Z} \Rightarrow D_f = \{n/n = k + \frac{1}{n} \mid k \in \mathbb{Z}\}$ Ⓟ ✓
الف) $y = \frac{r}{\sin n - 1}$ $\sin n - 1 \neq 0 \Rightarrow \sin n \neq 1$ $n \neq 2k\pi + \frac{\pi}{2} \Rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$  Ⓟ ✓	ب) $y = \frac{r}{r \sin^2 n - 1}$ $r \sin^2 n - 1 \neq 0$ $r \sin^2 n \neq 1 \Rightarrow \sin^2 n \neq \frac{1}{r} \Rightarrow \sin n \neq \pm \frac{\sqrt{r}}{r}$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$  ۵

الف) $y = \sqrt{r \sin n - 1}$ $(r \sin n - 1) \geq 0$ $r \sin n \geq 1$ $\sin n \geq \frac{1}{r}$  $D_f = \left[2k\pi + \frac{\pi}{2}, 2k\pi + \frac{\pi}{2} \right]$	ب) $y = \sqrt{\cos n - 1}$ $(\cos n - 1) \geq 0$ $\cos n \leq 1$  $D_f = \{ 2k\pi \}$	6
الف) $\cos y = n - r$ $-1 \leq n - r \leq 1$ $r - n \leq 1$ $n \leq r + 1$ $-r - 1 \leq n \leq r + 1$ $D_f = [-r-1, -r] \cup [r, r+1]$	ب) $y = \arcsin(n^r + r_{n+1})$ $-1 \leq n^r + r_{n+1} \leq 1$ $n^r + r_{n+1} = 0 \Rightarrow n = 0$ $n^r + r_{n+1} = 1 \Rightarrow n = 1$ $n^r + r_{n+1} = -1 \Rightarrow n = -1$ $D_f = [-r-1, -r] \cup [r, r+1]$	7
الف) $y = \sqrt{r - \log^{(n-r)}}$ $n-r \geq 0$ $n \geq r$ $r - \log^{(n-r)} \geq 0$ $\log^{(n-r)} \leq r$ $n-r \leq 9$ $n \leq 11$ $D_f = [r, 11]$	ب) $\log^{(n-r)}$ $n-r \geq 0$ $n(n+1)(n-1) = 0$ $n = 0, \pm 1$ $D_f = (-1, 0) \cup (1, +\infty)$	8
الف) $\frac{r}{r^n + 1}$ $r^n + 1 \neq 0$ $r^n \neq -1$ $r^n \neq -1$ $D_f = \mathbb{R}$	ب) $y = \frac{r}{r^n - 1}$ $r^n - 1 \neq 0$ $r^n \neq 1$ $n \neq 0$ $D_f = \mathbb{R} - \{0\}$	9
ب) $y = \frac{r}{r^n - r}$ $r^n - r \neq 0$ $r^n \neq r$ $n \neq 1$ $D_f = \mathbb{R} - \{1\}$	ب) $\frac{r}{r^n - r}$ $r^n - r \neq 0$ $r^n \neq r$ $n \neq 1$ $D_f = \mathbb{R} - \{1\}$	10
الف) $y = (n+1)!$ $n+1 \in \omega$ $n \in \frac{\omega-1}{d}$ $D_f = \{n/n = \frac{k-1}{d}, k \in \omega\}$	ب) $y = \left(\frac{r(n-r)}{r(n-d)}\right)!$ $\frac{r(n-r)}{r(n-d)} \in \omega$ $\frac{r(n-r)}{r(n-d)} = y \Rightarrow n = \frac{dy - b}{cy - d}$ $n \in \frac{-d\omega + r}{r\omega - r}$ $D_f = \{n/n = \frac{dk+r}{r(k-r)}, k \in \omega\}$	11