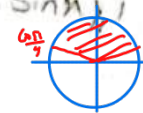
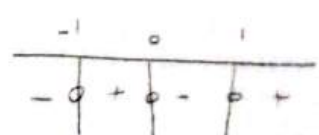


الف) $y = \sqrt{\frac{x^2-4x}{x^2-x}}$ ^{۱, ۵} $\frac{x^2-4x}{x^2-x} \geq 0 \Rightarrow \frac{x(x-4)}{x(x-1)} \geq 0$ $D_f = (-\infty, -1) \cup (0, 1) \cup (4, +\infty)$ ^(۱)	ب) $y = \sqrt{\frac{x^2-2x}{x^2-x}}$ ^{۱, ۵} $\frac{x^2-2x}{x^2-x} \geq 0 \Rightarrow \frac{x(x-2)}{x(x-1)} \geq 0$ $D_f = \mathbb{R} - \{0, -1\}$	۱
الف) $y = \frac{x+1}{\sqrt{x+ x }}$ $x+ x \geq 0 \Rightarrow x \geq -x$ $D_f = \mathbb{R}$ ^(۰, ۱, ۵)	ب) $y = \frac{1}{\sqrt{x x }}$ $x x \geq 0 \Rightarrow D_f = \mathbb{R}^+$ ^{۱, ۵} ✓	۲
الف) $y = \sqrt{2-[x]}$ $2-[x] \geq 0 \Rightarrow [x] \leq 2$ $x < 3$ $D_f = (-\infty, 3)$	ب) $y = \frac{1}{\sqrt{2-[x]}}$ $2-[x] > 0 \Rightarrow [x] < 2 \Rightarrow x < 2$ $D_f = (-\infty, 2)$ ^{(۰) ✓}	۳
الف) $y = \sqrt{[x-\frac{1}{2}]} + [x+\frac{1}{2}]$ ^{۱, ۵} $[x-\frac{1}{2}] + [x+\frac{1}{2}] \geq 0$ $x \leq \frac{1}{2} [x-\frac{1}{2}] + [x-\frac{1}{2}] + 1 \geq 0$ $D_f = [\frac{1}{2}, +\infty)$	ب) $y = \sqrt{[x-\frac{1}{2}]} + [-x+\frac{1}{2}]$ ^{۱, ۵} $[x-\frac{1}{2}] + [-x+\frac{1}{2}] \geq 0 \Rightarrow \begin{cases} a \in \mathbb{Z} & [a+[-a]] = 0 \\ a \in \mathbb{Z} & [a]+[-a] = -1 \end{cases}$ $D_f = \{x x = k + \frac{1}{2}, k \in \mathbb{Z}\}$	۴
الف) $y = \frac{r}{\sin x - 1}$ $\sin x - 1 \neq 0 \Rightarrow$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$	ب) $y = \frac{r}{r \sin^2 x - 1}$ $r \sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{r} \Rightarrow \sin x \neq \pm \sqrt{\frac{1}{r}}$ $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k \in \mathbb{Z}\}$	۵

1) $y = \sqrt{r \sin x - 1}$ $r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1$ $\sin x \geq \frac{1}{r}$ $\left[\arcsin \frac{1}{r}, \pi - \arcsin \frac{1}{r} \right]$ $D_f = \mathbb{R} - \left\{ \arcsin \frac{1}{r}, \pi - \arcsin \frac{1}{r} \right\}$ 	2) $y = \sqrt{\cos x - 1}$ $\cos x - 1 \geq 0 \rightarrow \cos x \geq 1$ $D_f = \mathbb{R} - \{ \pi \}$	6		
3) $\cos y = x ^{-1/r}$ $-1 \leq x ^{-1/r} \leq 1 \rightarrow$ $r \leq x \leq r$ $D_f = (r, \infty) \cup (-\infty, -r]$	4) $y = \arcsin(x^r + r^n + 1)$ $-1 \leq x^r + r^n + 1 \leq 1$ $x^r + r^n + 1 \geq -1 \rightarrow x^r + r^n \geq -2 \rightarrow (x+r)(x+1) \geq 0$ $x^r + r^n + 1 \leq 1 \rightarrow x^r + r^n \leq 0 \rightarrow x(x+r) \leq 0 \rightarrow -r \leq x \leq 0$ $D_f = (-\infty, -r] \cup [-r, 0)$	7		
5) $y = \sqrt{x - \log_r(x-r)}$ $x - \log_r(x-r) \geq 0$ $\log_r(x-r) \leq x$ $x - r \leq 1$ $x \leq r+1$ $D_f = (r, r+1]$	6) $y = \log(x^r - x)$ $x^r - x > 0 \rightarrow x(x^{r-1} - 1) > 0$ $x(x-1)(x+1) > 0$ $D_f = [-1, 0) \cup (1, +\infty)$ 	8		
7) $y = \frac{r}{x^n + 1}$ $x^n + 1 \neq 0$ $x^n \neq -1$ $D_f = \mathbb{R}$	8) $y = \frac{r}{x^n - 1}$ $x^n - 1 \neq 0$ $x^n \neq 1$ $D_f = \mathbb{R} - \{0\}$	9) $y = \frac{r}{x^n - r}$ $x^n - r \neq 0$ $x^n \neq r$ $x \neq \log_r r$ $D_f = \mathbb{R} - \{\log_r r\}$	10) $y = \frac{r}{x^n - r^n}$ $x^n - r^n \neq 0$ $x^n \neq r^n$ $x \neq \log_r r^n$ $D_f = \mathbb{R} - \{\log_r r^n\}$	9
11) $y = (x+1)!$ $(x+1) \in \mathbb{N} \rightarrow x \in \mathbb{N} - 1$ $x = \frac{w-1}{2}$ $D_f = \left\{ x \mid x = \frac{k-1}{2}, k \in \mathbb{N} \right\}$	12) $y = \left(\frac{x-r}{r(x-a)} \right)!$ $\frac{x-r}{r(x-a)} \in \mathbb{N} \rightarrow \frac{x-r}{r(x-a)} = k \in \mathbb{N}$ $x-r = k(r(x-a))$ $x-r = kr(x-a)$ $D_f = \left\{ x \mid x = \frac{-r+ak}{r-k}, k \in \mathbb{N} \right\}$	10		