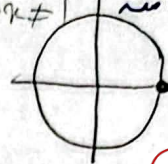
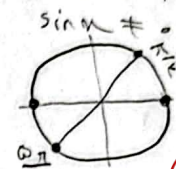


(۱) دامنه $\sin x + 3$ $\cos x \neq 1$
 $\cos x - 1$
 $P_f = \mathbb{R} - \{2k\pi\}$



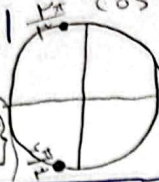
(۳)

(۲) دامنه $\cos x + 1$ $\cot x \neq 1$
 $\cot x - 1 \neq 0$
 $\frac{\cos x}{\sin x} - 1 \neq 0$
 $P_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$

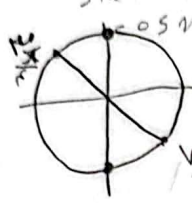


(۳)

(الف) $\frac{\sin x - 2}{2 \cos x + 1}$ $2 \cos x \neq -1$
 $\cos x \neq -\frac{1}{2}$
 $P_f = \mathbb{R} - \{2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}\}$



(الف) $2 \sin x + 1$ $\tan x \neq 1$
 $\sin x + \cos x \neq 0$
 $\frac{\sin x}{\cos x} + 1 \neq 0$
 $P_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$



(الف) $\sin y = x^2 - 2$ $-1 \leq x^2 - 2 \leq 1$
 $\Rightarrow 1 \leq x^2 \leq 3 \Rightarrow 1 \leq x \leq \sqrt{3}$
 $P_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

(ب) $y = \arccos(\sqrt{x} - 3)$ $x \geq 0$
 $-1 \leq \sqrt{x} - 3 \leq 1$
 $2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16$
 $P_f = [4, 16]$

(۳)

(الف) $\cos y = |x| - 3$ $-1 \leq |x| - 3 \leq 1$
 $\Rightarrow 2 \leq |x| \leq 4 \Rightarrow 2 \leq x \leq 4$
 $P_f = [-4, -2] \cup [2, 4]$

(۴) دامنه $2 \arcsin(x^2 + 3x + 1)$
 $1 - 1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow 0 \leq x^2 + 3x \leq 0 \Rightarrow x(x+3) = 0$
 $x = 0$ or $x = -3$
 $P_f = [-3, 0] \cup [0, 0] = [-3, 0]$

(۳)

(الف) $\log_2 x^2$ $x^2 > 0$
 $x > 0$ or $x < 0$
 $P_f = (-\infty, 0) \cup (0, +\infty)$

(ب) $\log_2 |x|$ $|x| > 0$
 $x > 0$ or $x < 0$
 $P_f = (-\infty, 0) \cup (0, +\infty)$

(۳)

(الف) $\log_{x-3} \omega - x$ $\omega - x > 0 \Rightarrow x < \omega$
 $x - 3 > 0 \Rightarrow x > 3$
 $x - 3 \neq 1 \Rightarrow x \neq 4$
 $P_f = (3, \omega) - \{4\}$

(ب) $\log_{x+3} x^2 - 1$ $x^2 - 1 > 0 \Rightarrow x > 1$ or $x < -1$
 $x + 3 > 0 \Rightarrow x > -3$
 $x + 3 \neq 1 \Rightarrow x \neq -2$
 $P_f = (-3, -1) \cup (1, +\infty) - \{-2\}$

(۳)

(الف) $\log \frac{x^2 - 4x + 3}{x - 3}$ $x - 3 \neq 0$
 $x \neq 3$
 $\frac{x^2 - 4x + 3}{x - 3} > 0$
 $(x-1)(x-3) > 0 \Rightarrow x > 3$
 $P_f = (3, +\infty) - \{3\}$

(ب) $\log \frac{x+3}{x-2}$ $x - 2 \neq 0$
 $x \neq 2$
 $\frac{x+3}{x-2} > 0$
 $(x+3)(x-2) > 0 \Rightarrow x > 2$
 $P_f = (-3, -2) \cup (2, +\infty) - \{2\}$

(۳)

الف) $\sqrt{r - \log_r(n-r)}$ $r > \log_r(n-r)$
 $n-r > 0 \Rightarrow n > r$
 $r - \log_r(n-r) > 0$
 $n-r < 1$
 $n < 1 + r$
 $D_f = (r, 1+r]$

ب) $\log_r(2 \log_r^n - 1)$ $r > 1$
 $2 \log_r^n - 1 > 0 \Rightarrow \log_r^n > \frac{1}{2}$
 $\Rightarrow \log_r^n > \frac{1}{2} \Rightarrow n > \sqrt{r}$
 $D_f = (\sqrt{r}, +\infty)$

الف) $\frac{r}{\epsilon^n + 1} \neq 0 \Rightarrow \epsilon^n \neq -1 \rightarrow$ $D_f = \mathbb{R}$

ب) $\frac{r}{\epsilon^n - 1} \neq 0 \Rightarrow \epsilon^n \neq 1 \Rightarrow n \neq 0$
 $D_f = \mathbb{R} - \{0\}$

2) $\frac{r}{\epsilon^n - r} \neq 0 \Rightarrow \epsilon^n \neq r \Rightarrow n \neq \log_r r$
 $D_f = \mathbb{R} - \{1\}$

3) $\frac{r}{\epsilon^n - r} \neq 0 \Rightarrow \epsilon^n \neq r \Rightarrow n \neq \log_r r$
 $D_f = \mathbb{R} - \{1\}$

الف) $(\epsilon^{n+1})!$
 $\epsilon^{n+1} \in \omega$
 $\epsilon^n \in \omega - 1$
 $n \in \frac{\omega - 1}{\epsilon}$
 $D_f = \{n \mid n = \frac{k-1}{\epsilon}, k \in \omega\}$

ب) $(\frac{r(n-r)}{r(n-\omega)})!$
 $\frac{r(n-r)}{r(n-\omega)} \in \omega$
 $r(n-r) = r(n-\omega)$
 $(r-r\omega)n = r-r\omega$
 $n = \frac{r-r\omega}{r-r\omega}$
 $D_f = \{n \mid n = \frac{r-r\omega}{r-r\omega}, k \in \omega\}$