

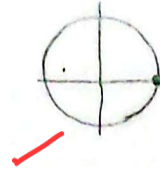
(1)

$\cos x - 1 \neq 0$
 $\cos x \neq 1$

(ب)

$P = \mathbb{R} - \{2k\pi + \pi\}$

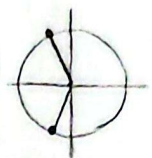
$(1, \pi)$



$\cos x + 1 \neq 0$
 $\cos x \neq -1$

(الف)

$P = \mathbb{R} - \{2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{\pi}{2}\}$



(2)

$\cot x - 1 \neq 0$
 $\cot x \neq 1$

(ب)

$P = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi\}$



$(\frac{\pi}{4}, \pi)$

$\tan x + 1 \neq 0$
 $\tan x \neq -1$

(الف)

$P = \mathbb{R} - \{k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}\}$



(3)

$-1 \leq \sqrt{x} - 3 \leq 1$
 $2 \leq \sqrt{x} \leq 4$
 $4 \leq x \leq 16$
 $P_f = [4, 16]$

(ب)

$(1, 5)$

$-1 \leq x^2 - 2 \leq 1$
 $1 \leq x^2 \leq 3$
 $1 \leq x \leq \sqrt{3}$
 $P_f = [1, \sqrt{3}] \cup [-\sqrt{3}, -1]$

(الف)

$-1 \leq x^2 + 3x + 1 \leq 1$
 $x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow x \in [-3, 0]$
 $x^2 + 3x + 1 \geq -1 \rightarrow (x+1)(x+2) \geq 0 \rightarrow x \in (-\infty, -2] \cup [-1, \infty)$
 $P_f = [-3, -2] \cup [-1, 0]$

(ب)

$(\frac{\pi}{2}, \pi)$

$-1 \leq |x| - 2 \leq 1$
 $2 \leq |x| \leq 3$
 $-3 \leq x \leq -2$
 $P_f = [-3, -2] \cup [2, 3]$

(الف)

(4)

$2 - |x| > 0$
 $|x| < 2$
 $-2 < x < 2$
 $P_f = (-2, 2)$

(ب)

$(\frac{\pi}{2}, \pi)$

$x^2 - 4 > 0$
 $x^2 > 4$
 $x > 2$
 $x < -2$
 $P_f = (2, +\infty) \cup (-\infty, -2)$

(الف)

(5)

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

(ب)

$(\frac{\pi}{2}, \pi)$

$5 - x > 0 \rightarrow x < 5$
 $x - 3 \neq 1 \rightarrow x \neq 4$
 $x - 3 > 0 \rightarrow x > 3$
 $P_f = (3, 5) - \{4\}$

(الف)

(6)

$$x > y \sim \frac{x+y}{x-y} > 0 \rightarrow x+y > 0$$

(ج)

$$x+\alpha > 0 \rightarrow x > -\alpha$$

$$x+\alpha \neq 1 \rightarrow x \neq 1-\alpha$$



$$D_f = (-\alpha, 1-\alpha) - \{1-\alpha\} \cup (1, +\infty)$$

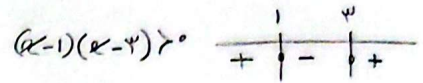
(د) ✓

$$\frac{x^2 - y^2 x + y}{x-y} > 0$$

(الف)

(v)

$$x^2 - y^2 x + y > 0$$



$$D_f = (1, -\infty) \cup (y, +\infty)$$

$$y \log_y^x - 1 > 0 \rightarrow \log_y^x > \frac{1}{y}$$

$$x > y^{\frac{1}{y}} = \sqrt[y]{y}$$

$$D_f = (\sqrt[y]{y}, +\infty)$$

(ج)

(1, \sqrt[y]{y})

$$y - \log_y^{(x-y)} \rightarrow x-y > 0 \rightarrow x > y$$

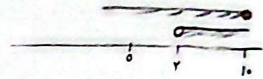
(الف)

(1)

$$\log_y^{(x-y)} < y \rightarrow x-y < y^y = 1$$

$$x < 1$$

$$D_f = [1, y)$$



$$D_f = \mathbb{R} - \log_y^y$$

(ج)

$$D_f = \mathbb{R} - \{1/y\}$$

(ج)

$$D_f = \mathbb{R} - \{0\}$$

(ج)

$$D_f = \mathbb{R}$$

(الف)

(9)

$$\frac{y(x-y)}{y-x-\alpha} \in W \rightarrow y(x-y) \in y(x-w) - \alpha w$$

(ج)

$$y(x-y) \in -\alpha w - y$$

$$x(y-y_w) \in -\alpha w - y$$

$$x \in \frac{-\alpha w - y}{y - y_w}$$

$$D_f = \{x/x = \frac{-\alpha k - y}{y - y_k}, k \in W\}$$

(د) ✓

$$y(x+1) \in W$$

(الف)

(10)

$$y(x) \in W - 1$$

$$x \in \frac{W-1}{y}$$

$$D_f = \{x/x = \frac{k-1}{y}, k \in W\}$$