

(1)

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

$$\cos x \neq 1$$

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

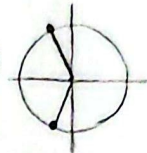


(ب)

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

$$\cos x \neq -\frac{1}{y}$$

$$P_f = \mathbb{R} - \left\{ 2k\pi + \frac{4\pi}{y}, 2k\pi + \frac{6\pi}{y} \right\}$$



(الف)

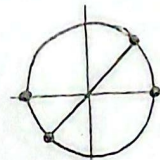
(2)

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

$$\sin x \neq 0$$

$$\cot x \neq 1$$

$$P_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi \right\}$$



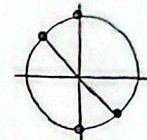
(ب)

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

$$\cos x \neq 0$$

$$\tan x \neq -1$$

$$P_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right\}$$



(الف)

(3)

$$-1 \leq \sqrt{x-3} \leq 1$$

$$2 \leq \sqrt{x} \leq 5$$

$$2 \leq x \leq 25$$

$$P_f = [2, 15]$$

(ب)

$$-1 \leq x^2 - 2 \leq 1$$

$$1 \leq x^2 \leq 3$$

$$1 \leq x \leq \sqrt{3}$$

$$P_f = [1, \sqrt{3}]$$

(الف)

(4)

$$-1 \leq x^2 + 3x + 1 \leq 1$$

$$\begin{aligned} x^2 + 3x \leq 0 &\rightarrow x(x+3) \leq 0 \rightarrow \begin{array}{c} + \quad - \quad + \\ -3 \quad 0 \end{array} \\ x^2 + 3x + 1 \geq -1 &\rightarrow (x+1)(x+2) \geq 0 \rightarrow \begin{array}{c} + \quad - \quad + \\ -1 \quad -2 \end{array} \end{aligned}$$



$$P_f = [-3, -1] \cup [-2, 0]$$

(ب)

$$-1 \leq |x-2| \leq 1$$

$$2 \leq |x| \leq 4$$

$$-2 \leq x \leq -4 \cup$$

$$P_f = [-2, -4] \cup [2, 4]$$

(الف)

(5)

$$2 - |x| > 0$$

$$|x| < 2$$

$$-2 < x < 2$$

$$P_f = (-2, 2)$$

(ب)

$$x^2 - 4 > 0$$

$$x^2 > 4$$

$$x > 2$$

$$x < -2$$

$$P_f = (2, +\infty) \cup (-\infty, -2)$$

(الف)

(6)

$$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow x > 1$$

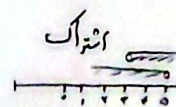
$$x < -1$$

$$x+3 \neq 1 \rightarrow x \neq -2$$

$$x+3 > 0 \rightarrow x > -3$$

$$P_f = (-3, -1) - \{-2\} \cup (1, +\infty)$$

(ب)



$$5 - x > 0 \rightarrow x < 5$$

$$x-3 \neq 1 \rightarrow x \neq 4$$

$$x-3 > 0 \rightarrow x > 3$$

$$P_f = (3, 5) - \{4\}$$

(الف)

$$x > y \sim \frac{x+y}{x-y} > 0 \rightarrow x+y > 0 \quad (c) \\ x > -y$$

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

$$x+\delta \neq 1 \rightarrow x \neq 1-y$$



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

$$\frac{x^2 - y^2 x + y}{x-y} > 0 \quad (الف) \quad (v)$$

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

$$(x-1)(x-y) > 0 \quad \begin{array}{c} | \quad | \\ + \quad - \end{array}$$

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

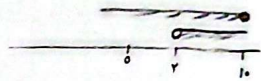
$$y \log_y^x - 1 > 0 \rightarrow \log_y^x > \frac{1}{y} \quad (c) \\ x > y^{\frac{1}{y}} = \sqrt[y]{y}$$

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

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

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

$$D_f = [1+y, y)$$



$$D_f = \mathbb{R} - \log_f^y \quad (c)$$

$$D_f = \mathbb{R} - \{\frac{1}{y}\} \quad (c)$$

$$D_f = \mathbb{R} - \{0\} \quad (c)$$

$$D_f = \mathbb{R} \quad (الف) \quad (9)$$

$$\frac{y(x-y)}{y-x} \in W \rightarrow y(x-y) \in yx - yW - \delta W \quad (c)$$

$$yx - yxW \in -\delta W - y$$

$$x(y - yW) \in -\delta W - y$$

$$x \in \frac{-\delta W - y}{y - yW}$$

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

$$yx + 1 \in W \quad (الف)$$

$$yx \in W - 1$$

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

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