

الف) $y = \frac{x+3}{2x^3+3x^2-8x+3} \mid x-1$

$(x+3)(2x-1)(x-1)$

$D_f = \mathbb{R} - \left\{-\frac{3}{2}, 1, \frac{1}{2}\right\}$

ب) $y = \frac{x+3}{2x^3+9x^2+13x+3} \mid x+1$

$(x+1)(2x+1)(x+3) = 0$

$D_f = \mathbb{R} - \left\{-\frac{3}{2}, -1, -\frac{1}{2}\right\}$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} \mid x-1$

$(x^2-x+1)(x-1)$

$\Delta < 0$
 معادله متبینه

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

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}}$

$\frac{x+3}{x^3-2x^2+2x-1} \geq 0 \Rightarrow \frac{x+3}{x-1} \geq 0$

$D_f = (1, -\frac{3}{2}] \cup (1, +\infty)$

$y = \frac{x}{x^2-\omega|x-1|-2x+\omega}$

۱) $|x-1| = 1-x \quad 1 \leq x$

۲) $|x-1| = x-1 \quad 1 > x$

$x^2-\omega(x-1)-2x+\omega=0$

$x^2-\omega(1-x)-2x+\omega=0$

$x^2-7x+6=0$

$x^2+3x=0 \Rightarrow x(x+3)=0$

$(x-2)(x-3)=0$

$D_f = \mathbb{R} - \{0, -3, 2, 3\}$

الف) $y = \frac{x+3}{|2x+1|-|x+3|}$

$|2x+1|=|x+3|$ ۱) $x > -\frac{1}{2}, x \geq \frac{3}{2}$

۲) $x \geq -3, x < -\frac{1}{2}$

$D_f = \mathbb{R} - \left\{-\frac{5}{2}, \frac{1}{2}\right\}$

$-2x-1=x+3 \Rightarrow -3x=4 \Rightarrow x=-\frac{4}{3}$

۲) $x < -3, x < -\frac{1}{2}$
 $-2x-1=-x-3 \Rightarrow -x=-2 \Rightarrow x=2$

ب) $y = \sqrt{|2x+1|-|x+3|}$

$|x+3| \leq |2x+1| \Rightarrow 0 \leq |2x+1|-|x+3|$

$D_f = (-\infty, -\frac{5}{2}] \cup [2, +\infty)$

بر روی حالات اکتاف توجه کنید

الف) $y = \log_p \frac{(1-\log_p x)}{x}$ $x \neq 1, x > 0$

$x > 0$

$1-\log_p x > 0 \Rightarrow \log_p x < 1 \Rightarrow x < p$

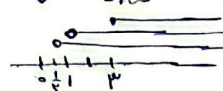
$D_f = (0, p)$

ب) $y = \log_p \frac{(1-\log_p \frac{1}{x})}{\frac{1}{x}}$ $x \neq 1, x > 0$

$x > 0$

$1-\log_p \frac{1}{x} > 0 \Rightarrow \log_p \frac{1}{x} < 1 \Rightarrow x < \frac{1}{p}$

$D_f = (0, \frac{1}{p})$

$$f(x) = \sqrt{\log_{\omega}(\gamma x - 1)}$$


$$D_f = [3, +\infty)$$

$$\gamma x - 1 > 0 \Rightarrow \gamma x > 1 \Rightarrow x > \frac{1}{\gamma}$$

$$\log_{\omega}(\gamma x - 1) > 0 \Rightarrow \gamma x - 1 > 1 \Rightarrow \gamma x > 2 \Rightarrow x > \frac{2}{\gamma}$$

$$\log_{\frac{1}{\gamma}}(\gamma x - 1) > 0 \Rightarrow \log_{\omega}(\gamma x - 1) > 1 \Rightarrow \gamma x - 1 > \omega \Rightarrow \gamma x > \omega + 1 \Rightarrow x > \frac{\omega + 1}{\gamma}$$

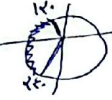
$$f(x) = \log(\gamma \cos x + 1)$$

$$\gamma \cos x + 1 > 0 \Rightarrow \gamma \cos x > -1$$

$$\cos x > -\frac{1}{\gamma} \quad (-1 \leq \cos x \leq 1)$$

$$x = 2k\pi + \frac{\gamma\pi}{\gamma}, \quad x = 2k\pi + \frac{5\pi}{\gamma}$$

$$D_f = \mathbb{R} - \left[2k\pi + \frac{\gamma\pi}{\gamma}, 2k\pi + \frac{5\pi}{\gamma}\right]$$



$$\gamma = \sqrt{\log \frac{x-1}{x+1}}$$

$$\frac{x-1}{x+1} > 0$$

$$1) \text{ منفي } > 0 \quad \frac{x-1}{x+1} < 0$$

$$2) \text{ مثبتي } > 0 \quad \frac{x-1}{x+1} > 0$$

$$(-\infty, -1) \cup (1, +\infty)$$

$$\log \frac{x-1}{x+1} > 0$$

$$\frac{x-1}{x+1} > 1 \Rightarrow \frac{x-1}{x+1} - 1 > 0$$

$$\frac{x-1-(x+1)}{x+1} > 0 \Rightarrow \frac{-2}{x+1} > 0 \Rightarrow x+1 < 0 \Rightarrow x < -1$$

$$D_f = (-\infty, -1)$$

$$f(x) = \sqrt{(a+\gamma)x^2 + ax + b} \Rightarrow (-\infty, 3] \quad b=5$$

$$(a+\gamma)x^2 + ax + b > 0$$

$$a+\gamma > 0$$

$$\Delta = a^2 - 4(a+\gamma)b < 0$$

$$\frac{a^2}{4(a+\gamma)} < \frac{f(a+\gamma)x+b}{4(a+\gamma)} \Rightarrow b > \frac{a^2}{4(a+\gamma)}$$

$$f(x) = \sqrt{x^2 + \gamma x + \gamma - m^2}$$

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

$$x^2 + \gamma x + \gamma - m^2 \geq 0$$

$$(x+1)^2 + 1 - m^2 \geq 0$$

$$1 - m^2 \geq 0 \Rightarrow m^2 \leq 1 \Rightarrow -1 \leq m \leq 1$$

$$1 - (-1) = 2$$

$$f(x) = \frac{\sqrt{1-x^2}}{[x] + [-x] + 1}$$

$$1-x^2 \geq 0 \Rightarrow -1 \leq x \leq 1$$

$$[x] + [-x] = \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases} \Rightarrow [x] + [-x] + 1 = \begin{cases} 1 & x \in \mathbb{Z} \\ 0 & x \notin \mathbb{Z} \end{cases}$$

$$D_f = [-1, 1]$$