

۱ الف) $y = \frac{x+3}{2x^3+3x^2-11x+3} \xrightarrow{\div x-1} \frac{x+3}{(x-1)(2x^2+5x+3)} \Rightarrow D_f = R - \{-\frac{3}{2}, -1, 1\}$

ب) $y = \frac{x+3}{2x^3+3x^2+10x+3} \xrightarrow{\div x+1} \frac{x+3}{(x+1)(2x^2+7x+3)} \Rightarrow D_f = R - \{-3, -1, -\frac{1}{2}\}$
 $\text{ac} \rightarrow x^2+7x+3 = (x+4)(x+1) = \frac{-9}{2} \pm \frac{1}{2}$

۲ الف) $y = \frac{x+3}{x^3-2x^2+2x-1} \xrightarrow{\div x-1} \frac{x+3}{(x-1)(x^2-x+1)} \Rightarrow D_f = R - \{1\}$

ب) $\sqrt{\frac{x+3}{x^3-2x^2+2x-1}} \geq 0 \Rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0 \Rightarrow \frac{-3}{2} \quad | \quad \frac{1}{2} \quad | \quad \frac{1}{2} \Rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$

۳ $y = \frac{2}{x^2-5|x-1|-2x+5} \xrightarrow{\text{if}} \begin{cases} x \geq 1 \rightarrow x^2-5x+5-2x+5 = x^2-7x+10 = (x-5)(x-2) \text{ I} \\ x < 1 \rightarrow x^2+5x-5-2x+5 = x^2+3x = x(x+3) \text{ II} \end{cases}$
 $I = (x-2)(x-5) = 0 \Rightarrow x = 2, 5$
 $II = x^2+3x = 0 \Rightarrow x = 0, -3$
 $D_f = R - \{-3, 0, 2, 5\}$

۴ الف) $y = \frac{x+3}{|2x+1|-|x+3|} \neq 0 \Rightarrow |2x+1|-|x+3| = 0$
 $|2x+1| = |x+3| \Rightarrow \begin{cases} 2x+1 = x+3 \Rightarrow x=2 \\ 2x+1 = -(x+3) \Rightarrow x=-\frac{4}{3} \end{cases}$
 $D_f = R - \{-\frac{4}{3}, 2\}$
 $D_f = (-\infty, -\frac{4}{3}] \cup (2, +\infty)$
 ب) $y = \sqrt{|2x+1|-|x+3|} \geq 0 \Rightarrow |2x+1| \geq |x+3| \Rightarrow \begin{cases} 2x+1 \geq x+3 \Rightarrow x \geq 2 \\ 2x+1 \geq -(x+3) \Rightarrow x \geq -\frac{4}{3} \end{cases}$
 $3x^2-2x-1 \geq 0 \Rightarrow \frac{-\frac{2}{3}}{2} \pm \frac{1}{2} \Rightarrow \frac{-1}{3} \pm \frac{1}{2} \Rightarrow \frac{1}{6}, -\frac{5}{6}$

۵ الف) $y = \log_r(1-\log_r^x)$
 $\Rightarrow 1-\log_r^x > 0 \Rightarrow 1 > \log_r^x \Rightarrow (r^1 > x) \text{ I}$
 $(x > 0) \text{ II} \Rightarrow I \cap II = (0, 3)$

ب) $\log_r(1-\log_r^{\frac{1}{r}})$
 $\Rightarrow (I \text{ } x > 0) \quad 1-\log_r^{\frac{1}{r}} > 0 \Rightarrow 1 > \log_r^{\frac{1}{r}} \Rightarrow (\frac{1}{r} < x) \text{ II}$
 $\leftarrow \frac{1}{r} \rightarrow = (\frac{1}{r}, +\infty) = D_f$

$D_f = I \cap II$

$$y = \sqrt{\log_{1/2} \log_{1/2} (xy-1)}$$

$$xy-1 > 0 \Rightarrow xy > 1 \Rightarrow \boxed{xy > 1} \text{ I}$$

$$\log_{1/2} xy-1 \Rightarrow xy-1 > 1 \Rightarrow xy > 2 \Rightarrow \boxed{xy > 2} \text{ II}$$

$$\log_{1/2} \log_{1/2} (xy-1) \Rightarrow \log_{1/2} (xy-1) \leq 1 \Rightarrow xy-1 \leq 2 \Rightarrow xy \leq 3$$

Intersection

$$I \cap II \cap III = \emptyset \Rightarrow \text{Domain } D_f = (1, 3]$$

$$xy \leq 3 \Rightarrow \boxed{xy \leq 3} \text{ III}$$

$$\text{الف) } y = \log_r (r \cos x + 1) \rightarrow a$$

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



$$\Rightarrow D_f = R - [rkR + R - \frac{R}{r}, rkR + R + \frac{R}{r}]$$

$$\text{ب) } y = \sqrt{\log_{1/2} \frac{x-1}{x+1}} \rightarrow \frac{x-1}{x+1} > 0$$

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

$$\text{II } (-\infty, -1)$$

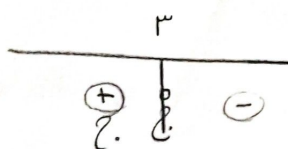
$$\log_{1/2} \frac{x-1}{x+1} > 0 \Rightarrow \frac{x-1}{x+1} > 1$$

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

$$* I \cap III = (-\infty, -1) \cup (1, \infty)$$

$$f(x) = \sqrt{(a+r)x^2 + ax + b} > 0 \rightarrow$$

$$D_f = (-\infty, r]$$



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$$ax + b \Rightarrow -r(r) + b = 0 \Rightarrow b = r \quad \leftarrow a = -r$$

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

* 1. ايجاد دلتا

$$\Delta = b^2 - 4ac \rightarrow \varepsilon - \varepsilon(1)(r - m^2) = \varepsilon - 1 + \varepsilon m^2 = -\varepsilon + \varepsilon m^2 > 0$$

$$\varepsilon m^2 > \varepsilon \Rightarrow m^2 > 1 \rightarrow \frac{-1}{\min} < m < \frac{1}{\max} \Rightarrow 1 - (-1) = 2 \rightarrow \boxed{2}$$

$$f(x) = \frac{\sqrt{\varepsilon - x^2}}{[x] + [-x] + 1} \rightarrow \neq 0$$

$$[x] + [-x] \begin{cases} x \in Z \Rightarrow 0 \\ x \notin Z \Rightarrow -1 \end{cases} \Rightarrow [x] + [-x] + 1 \begin{cases} x \in Z \Rightarrow 1 \\ x \notin Z \Rightarrow 0 \end{cases} \Rightarrow \boxed{x \in Z} \text{ I}$$

$$\sqrt{\varepsilon - x^2} > 0 \Rightarrow \varepsilon - x^2 > 0 \Rightarrow \varepsilon > x^2 \Rightarrow \boxed{-\sqrt{\varepsilon} < x < \sqrt{\varepsilon}} \text{ II} \Rightarrow I \cap II \Rightarrow D_f = \{-\sqrt{\varepsilon}, -1, 0, 1, \sqrt{\varepsilon}\}$$

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