

الف) $\frac{x+3}{2x^3+3x^2-11x+3} \neq 0 \rightarrow (x-1)(2x^2+5x-3) = (x-1)(x+3)(x-\frac{1}{2}) \rightarrow$
 $D_f = \mathbb{R} - \{-3, \frac{1}{2}, 1\}$

ب) $\frac{x+3}{2x^3+9x^2+10x+3} \neq 0 \rightarrow (x+1)(2x^2+7x+3) = (x+1)(x+\frac{1}{2})(x+3) \rightarrow$
 $D_f = \mathbb{R} - \{-3, -1, -\frac{1}{2}\}$

الف) $\frac{x+3}{x^3-2x^2-2x-1} \neq 0 \rightarrow (x-1)(x^2-x+1) \xrightarrow{\Delta < 0} D_f = \mathbb{R} - \{1\}$
 ب) $\sqrt{\frac{x+3}{x^3-2x^2-2x-1}} \rightarrow (x-1)(x^2-x+1) \xrightarrow{\Delta < 0} D_f = (-\infty, -3] \cup (1, +\infty)$

$y = \frac{2}{x^2-5|x-1|-2x+5} \rightarrow \frac{1}{\frac{x^2-3x}{x(x+3)} \cdot \frac{x^2-7x+10}{(x-5)(x-2)}} \rightarrow D_f = \mathbb{R} - \{-3, 0, 2, 5\}$

الف) $\frac{x+3}{|2x+1|-|x+3|} \neq 0 \rightarrow \frac{-3}{-x+2} \cdot \frac{-\frac{1}{2}}{-3x-5} \cdot \frac{1}{x-2} \rightarrow D_f = \mathbb{R} - \{-\frac{5}{3}, 2\}$
 ب) $\sqrt{|2x+1|-|x+3|} \geq 0 \rightarrow \frac{-3}{-x+2} \cdot \frac{-\frac{1}{2}}{-3x-5} \cdot \frac{1}{x-2} \rightarrow D_f = (-\infty, -\frac{5}{3}] \cup [2, +\infty)$

الف) $y = \log_x(1-\log_x x) \rightarrow 1-\log_x x > 0 \rightarrow \log_x x < 1 \rightarrow x < 1 \text{ (د)}$
 $\hookrightarrow x > 0 \text{ (ب)}$
 ب) $\log_x(1-\log_x x) \rightarrow \log_x x > 1 \rightarrow x > \frac{1}{x} \rightarrow D_f = (\frac{1}{2}, +\infty)$
 $\hookrightarrow x > 0$

$$f(x) = \log_{\frac{1}{2}} \log_0^{(x-1)} \rightarrow x-1 > 0 \rightarrow x > \frac{1}{2} \quad \text{①} \cap \text{②} \cap \text{③} \rightarrow D_f = (1, 2]$$

$$\hookrightarrow \log_0^{x-1} > 0 \rightarrow x-1 > 1 \rightarrow x > 2 \quad \text{④} \quad \text{⑤}$$

$$\hookrightarrow \log_{\frac{1}{2}} \log_0^{(x-1)} \geq 0 \rightarrow \log_0^{x-1} \leq 1 \rightarrow x-1 \leq 0 \rightarrow x \leq 1 \quad \text{⑥}$$

$$\text{الف, } \log(\sqrt{\cos x + 1}) \rightarrow \sqrt{\cos x + 1} > 0 \rightarrow \cos x > -1 \quad \text{⑦} \quad D_f = \left(k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2} \right)$$

$$\text{ب, } \sqrt{\log \frac{x+1}{x-1}} \quad \frac{x+1}{x-1} > 0 \rightarrow \frac{x+1}{x-1} > 1 \quad \text{⑧} \cap \text{⑨} \rightarrow D_f = (-\infty, -1)$$

$$\log_{\frac{1}{2}} \frac{x+1}{x-1} \geq 0 \quad \frac{x+1}{x-1} \geq 1 \rightarrow \frac{x+1 - x - 1}{x-1} = \frac{-2}{x-1} \geq 0 \quad \text{⑩}$$

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

$$\text{if } a=-r \rightarrow f(x) = \sqrt{-rx^2 + b} \rightarrow \text{if } x=r \rightarrow \sqrt{-r^2 + b} \rightarrow b=r^2$$

$$f(x) = \sqrt{x^2 + px + q - m^2} \rightarrow \Delta < 0 \rightarrow f - x + fm^2 < 0 \rightarrow fm^2 < f \rightarrow m^2 < 1$$

$$-1 < m < 1$$

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

$$\sqrt{f-x^2} \geq 0 \rightarrow -x \leq x \leq x$$

$$[x] + [-x] + 1 \rightarrow \neq 0 \rightarrow [x] + [-x] \neq -1 \rightarrow x \in \mathbb{Z}$$

$$D_f = \{-1, 0, 1\}$$