

①

$$الف) \frac{x+3}{(x-1)(2x+4)(2x-1)} \Rightarrow D_f = \mathbb{R} - \left\{1, -2, \frac{1}{2}\right\}$$

$$ب) \frac{x+3}{(x+1)(2x+2)(2x+1)} \Rightarrow D_f = \mathbb{R} - \left\{-1, -2, -\frac{1}{2}\right\}$$

②

$$الف) \frac{x+3}{(x-1)(x^2-x+1)} \Rightarrow D_f = \mathbb{R} - \left\{-2, 1\right\}$$

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

③

$$\begin{array}{c|c} \text{①} & \\ \hline x^2 + \Delta x + \Delta - 2x + \Delta & x^2 - \Delta x + \Delta - 2x + \Delta \\ \hline x^2 + 3x = 0 & x^2 - \Delta x + 1 = 0 \Rightarrow x = 2, \Delta \\ x = 0, 3 & \end{array}$$

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

④

$$الف) |2x+1| \neq |x+3| \Rightarrow (2x+1)^2 \neq (x+3)^2$$

$$(2x+1)^2 - (x+3)^2 \neq 0 \Rightarrow \underbrace{(2x+1+x+3)}_{(3x+4)} \underbrace{(2x+1-x-3)}_{(x-2)} \neq 0$$

$$(3x+4)(x-2) \Rightarrow D_f = \mathbb{R} - \left\{-\frac{4}{3}, 2\right\}$$

$$ب) |2x+1| \geq |x+3| \Rightarrow (2x+1)^2 \geq (x+3)^2 \Rightarrow (3x+4)(x-2) \geq 0$$

$$\frac{+}{+} - \frac{-}{+} \Rightarrow D_f = \left[-\infty, -\frac{4}{3}\right] \cup [2, +\infty)$$

①

$$\text{الف) } \log_r(1 - \log_r^n) \Rightarrow \boxed{x > 0} \quad 1 - \log_r^n > 0$$

$$\log_r^n < 1 \quad \boxed{n < 2} \Rightarrow \boxed{0 < n < 2} \Rightarrow D_f = [0, 2)$$

$$\text{ب) } \boxed{x > 0} \quad \log_1^n < 1 \Rightarrow \boxed{n > \frac{1}{x}} \Rightarrow D_f = \left(\frac{1}{x}, +\infty\right)$$

$$\text{ج) } 2x-1 > 0 \Rightarrow 2x > 1 \Rightarrow \boxed{x > \frac{1}{2}} \quad \log_a^{2x-1} > 0$$

$$\Rightarrow 2x-1 \geq 1 \Rightarrow 2x \geq 2 \Rightarrow \boxed{x \geq 1}$$

$$\log_{a,0} \log_a^{(2x-1)} > 0 \quad \log_a^{(2x-1)} \leq 1 \Rightarrow 2x-1 \leq 1 \Rightarrow \boxed{x \leq 1}$$

$$D_f = (1, 2)$$

④

$$\text{الف) } 2\cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2} \quad D_f = \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3}\right)$$

$$\text{ب) } \frac{x-1}{x+1} > 0 \quad \frac{-1}{+} \frac{1}{-} \Rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$$

$$\text{ج) } \boxed{a = -2} \quad -x + b = f(x) \Rightarrow -4 + b = 0 \Rightarrow \boxed{b = 4}$$

$$\text{د) } 1 - 1(1 - m^2) < 0 \Rightarrow 1 - 1 + m^2 < 0 \Rightarrow m^2 < 0$$

$$\frac{-1}{+} \frac{1}{-} \Rightarrow 1 - (-1) = 2$$

$$\text{ه) } f(x) = \frac{\sqrt{4-x^2}}{[x] + [-x] + 1} \rightarrow \frac{-2}{[-1] - 1} = [-1, 1]$$

$$[x] + [-x] \xrightarrow{\text{خاصة}} \text{ج) } \boxed{x \in \mathbb{Z}}$$

$$\boxed{x \in \mathbb{Q}}$$