

الف) $y = \frac{x+3}{2x^3+3x^2-12x+3}$ $\rightarrow 2x^3+3x^2-12x+3 \neq 0 \Rightarrow 2x^3+3x^2-12x+3 = 0$
 $\rightarrow x = \frac{1}{2}, x = -3$
 $(x-1)(2x^2+5x-3) \neq 0 \Rightarrow D_y = \mathbb{R} - \{1, \frac{1}{2}, -3\}$
 $\Delta < 0, a > 0 \Rightarrow \oplus$

ب) $y = \frac{x+4}{2x^3+9x^2+10x+4}$ $\rightarrow 2x^3+9x^2+10x+4 \neq 0$
 $\rightarrow x = -1, x = -4$
 $\Rightarrow D_y = \mathbb{R} - \{-1, -\frac{1}{2}, -4\}$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1}$ $\rightarrow x^3-2x^2+2x-1 \neq 0$
 $\rightarrow x = 1$
 $(x^2-x+1)(x-1) \neq 0 \Rightarrow D_y = \mathbb{R} - \{1\}$
 $\Delta < 0, a > 0 \Rightarrow \oplus$

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}}$ $\Rightarrow \frac{x+3}{(x-1)(x^2-x+1)} > 0$
 $\Rightarrow D_y = (-\infty, -3] \cup (+1, +\infty)$

$x^2 - 2|x-1| - 2x + 2 \neq 0$ $\rightarrow x \geq 1 \rightarrow x^2 - 2x + 2 - 2x + 2 \neq 0$
 $\Rightarrow x^2 - 4x + 4 \neq 0 \rightarrow (x-2)(x-2) \neq 0 \Rightarrow x \neq 2, x \neq 2$
 $x < 1 \rightarrow x^2 + 3x \neq 0 \Rightarrow x(x+3) \neq 0 \Rightarrow x \neq -3, x \neq 0$
 $\Rightarrow D_y = \mathbb{R} - \{-3, 2, 0\}$

الف) $\rightarrow |2x+1| \neq |x+3| \rightarrow 2x^2+1+2x \neq x^2+9+4x \Rightarrow$
 $x^2-2x-8 \neq 0 \Rightarrow (x-4)(x+2) \neq 0$
 $\Rightarrow x \neq 4, x \neq -2 \Rightarrow D_y = \mathbb{R} - \{4, -2\}$

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

الف) $\rightarrow x > 0, 1 - \log_{\frac{x}{2}} > 0 \Rightarrow \log_{\frac{x}{2}} < 1 \Rightarrow x < 2 \Rightarrow D_f = (0, 2)$

ب) $\rightarrow x > 0, 1 - \log_{\frac{x}{2}} > 0 \Rightarrow \log_{\frac{x}{2}} < 1 \Rightarrow x > \frac{1}{2} \Rightarrow D_f = (\frac{1}{2}, +\infty)$

$\log_{\frac{1}{2}} \log_a^{(2n-1)} \geq 0 \Rightarrow 2n-1 \geq 0 \Rightarrow n \geq \frac{1}{2}, \log_a^{(2n-1)} > 0 \Rightarrow$
 $2n-1 > 1 \Rightarrow n > 1, \log_{\frac{1}{2}} \log_a^{(2n-1)} \geq 0$
 $\Rightarrow \log_a^{(2n-1)} \leq 1 \Rightarrow 2n-1 \leq a \Rightarrow n \leq \frac{a+1}{2} \Rightarrow D_f = [1, \frac{a+1}{2}]$

الف) $\rightarrow |\cos x + 1| > 0 \Rightarrow \cos x > -\frac{1}{2} \Rightarrow D_f = (2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3})$

ب) $\frac{x-1}{x+1} > 0 \rightarrow \frac{-1}{+ \frac{1}{3} - \frac{1}{3} +} \textcircled{1}, \log_{\frac{x-1}{x+1}} > 0 \Rightarrow \frac{x-1}{x+1} > 1 \Rightarrow \frac{x-1-x-1}{x+1} > 0$
 $\Rightarrow \frac{-2}{x+1} > 0 \rightarrow (-\infty, -1) \textcircled{2} \Rightarrow D_f = (-\infty, -1)$

$f(x) = \sqrt{(a+x)x^2 + ax + b} \rightarrow D_f = (-\infty, 2] \Rightarrow \text{Circled } C$
 $\Rightarrow a + 2 = 0 \Rightarrow a = -2 \text{ f(2) so } 4a + b = 0 \Rightarrow b = 8$

$x^2 + 2x + 2 - m^2 \geq 0 \quad D_f = \mathbb{R} \rightarrow \Delta = 0, a > 0$
 $\Rightarrow b^2 - 4ac \geq 0 \Rightarrow 4 - 4(2-m^2) \geq 0 \Rightarrow m^2 \geq 1 \Rightarrow m = \pm 1 \Rightarrow \text{Circled } P$

الف) $x^2 \geq 0 \Rightarrow x^2 \leq 2 \Rightarrow -\sqrt{2} \leq x \leq \sqrt{2}$
 ب) $[x] + [-x] + 1 \neq 0 \rightarrow [x, -x] \neq -1 \rightarrow \dots \Rightarrow x \in \mathbb{Z}$
 $\Rightarrow D_f = \{-2, -1, 0, 1, 2\}$