

الف) $\Delta \geq 0 \rightarrow a=2$ $f(x) = \sqrt{4x+b}$ $\rightarrow \frac{3}{-1+1} f(x) = 0 = \sqrt{4+b}$ (1)
 $\rightarrow b = -4$

ب) $\Delta \leq 0 \rightarrow f - f(1-m^2) \leq 0 \rightarrow 1-2+m^2 \leq 0 \rightarrow \frac{-1}{+1} \frac{1}{-1+1} \rightarrow 1-(-1) = 2$ (2)

ج) $I \ 4-x^2 > 0 \rightarrow \frac{-2}{-1+1} \rightarrow -2 < x < 2$ $\{ II \ [x] + [-x] \neq -1 \rightarrow x \in \mathbb{Z}$ (3)
 $x \in \{-2, -1, 0, 1, 2\}$



د) الف) $x^3 + 3x^2 \geq 0 \rightarrow x^2(x+3) \geq 0 \rightarrow \frac{-3}{-1+1} \rightarrow D_f = [-3, +\infty)$ (4)

ب) $\frac{(x^2-1)(x^3-3x^2)}{x^3-1} \geq 0 \rightarrow \frac{(x-1)(x+1)(x^2)(x-3)}{(x-1)(x^2+x+1)}$ (5)
 $\frac{-1}{+} \frac{0}{-} \frac{0}{-} \frac{3}{+}$

$D(f) = (-\infty, -1] \cup [3, +\infty) \cup \{0\}$

ج) $|2-x| \leq 4 \rightarrow -2 \leq x \leq 6$ (6)
 $\rightarrow -2 \leq x \leq 6 \quad D_f = [-2, 6]$

الف) $|x-2| \geq 3 \rightarrow x \geq 5$ (7)
 $D_f = (-\infty, -1] \cup [5, +\infty)$

د) الف) $x|x| \leq 1 \rightarrow \begin{cases} x > 0 \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1 \\ x < 0 \rightarrow -x^2 \leq 1 \rightarrow x^2 \geq -1 \rightarrow x \in (-\infty, 0] \end{cases}$ (8)
 $\rightarrow D_f = (-\infty, 1]$

ب) $I \ 3 - |x-2| \geq 0 \rightarrow |x-2| \leq 3 \rightarrow -3 \leq x-2 \leq 3$

$II \ 3 - |x-2| \neq 1 \rightarrow |x-2| \neq 2 \rightarrow \begin{cases} x-2 \neq 2 \rightarrow x \neq 4 \\ x-2 \neq -2 \rightarrow x \neq 0 \end{cases} \rightarrow 2 \leq x \leq 4$ (9)
 $I \cap II \ D_f = [2, 4] - \{0, 4\}$

الف) $\cos x \neq 0 \quad D = \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$ (10)

ب) $2 \cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2} \rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{3}, k\pi - \frac{\pi}{3}\}$ (11)

الف) $|2x+1| - |x+3| \neq 0 \rightarrow |2x+1| \neq |x+3|$ (1)

$\rightarrow 2x+1 \neq x+3 \rightarrow x \neq 2$ (5) $\rightarrow x \neq 2$

$\rightarrow \frac{-\frac{1}{2}}{+\frac{1}{2}-\frac{1}{2}+}$

ب) $|2x+1| - |x+3| \geq 0 \rightarrow |2x+1| \geq |x+3| \rightarrow 2x+1 \geq x+3$

$2x+1 \geq x+3 \rightarrow x \geq 2$ $D_f = (-\infty, 2] \cup [2, \infty)$

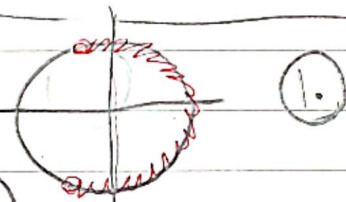
I $2x+1 > 0 \rightarrow x > -\frac{1}{2}$ II $\log_{\frac{1}{2}}(2x+1) > 0 \rightarrow 2x+1 > 1 \rightarrow x > 0$ (4)

III $\log_{\frac{1}{2}} \log_{\frac{1}{2}}(2x+1) \geq 0 \rightarrow \log_{\frac{1}{2}}(2x+1) \leq 1 \rightarrow 2x+1 \geq \frac{1}{2} \rightarrow x \geq -\frac{1}{4}$

$D_f = (-\frac{1}{4}, \infty)$

الف) $2\cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{2}$

$D_f = (2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3})$



ب) I $\frac{x-1}{x+1} > 0 \rightarrow \frac{-1}{+\frac{1}{2}} - \frac{1}{-\frac{1}{2}+}$

II $\log_{\frac{1}{2}} \frac{x-1}{x+1} \geq 0 \rightarrow \frac{x-1}{x+1} \leq 1 \rightarrow \frac{x-1}{x+1} - 1 \leq 0 \rightarrow \frac{x-1-x-1}{x+1} \leq 0$

$\rightarrow \frac{-2}{x+1} \leq 0 \rightarrow \frac{-1}{+\frac{1}{2}-} (-\infty, -1]$

$I \cap II \rightarrow D = (-\infty, -1]$