

الف)  $x \neq \pm \frac{\sqrt{3}\pi}{3} + k\pi, k \in \mathbb{Z} \Rightarrow D_f = \mathbb{R} - \{x \mid \cos x = -\frac{1}{2}\}$

ب)  $D_f = \mathbb{R} - \{x = k\pi, k \in \mathbb{Z}\}$

الف)  $\tan x \neq -1 \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{3\pi}{4}, k\pi + \frac{7\pi}{4}\}$

ب)  $\cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}$

الف)  $-1 < x^2 - 2 < 1 \Rightarrow 1 < x^2 < 3 \Rightarrow D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

$\sqrt{x} - 2 > 0 \Rightarrow \sqrt{x} > 2 \Rightarrow x > 4 \Rightarrow D_f = [4, 16]$

ب)  $-1 < \sqrt{x} - 2 < 1 \Rightarrow 1 < \sqrt{x} < 3 \Rightarrow x > 1, x < 9$

الف)  $-1 < |x| - 2 < 1 \Rightarrow 1 < |x| < 3 \Rightarrow \pm 1 < x < \pm 3 \Rightarrow [-3, -1] \cup [1, 3]$

ب)  $x^2 + 2x + 1 > -1 \Rightarrow x^2 + 2x + 2 > 0 \Rightarrow (x+1)(x+2) > 0 \Rightarrow x < -2 \text{ یا } x > -1$

$x^2 + 2x + 1 < 1 \Rightarrow x^2 + 2x < 0 \Rightarrow x(x+2) < 0 \Rightarrow -2 < x < 0$   
 $\Rightarrow [-2, 0]$

الف)  $x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow x > 2 \text{ یا } x < -2 \Rightarrow D_f = (-\infty, -2) \cup (2, +\infty)$

ب)  $2 - |x| > 0 \Rightarrow 2 > |x| \Rightarrow -2 < x < 2 \Rightarrow D_f = (-2, 2)$

|                                                                                                                                                                                                                        |                                                                  |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----|
| $\omega - x < 0 \Rightarrow \omega > x \Rightarrow D_f = (c, \omega)$<br>$x - x < 0 \Rightarrow c < x \Rightarrow D_f = (c, \omega)$                                                                                   | الف                                                              |    |
| $x - 1 < 0 \Rightarrow \text{(x-1) < 0} \Rightarrow x > 1$                                                                                                                                                             | ب                                                                | ٦  |
| $x + c < 0 \Rightarrow x < -c \Rightarrow D_f = (-\infty, +\infty)$                                                                                                                                                    |                                                                  |    |
| $\frac{x^2 - 2x + c}{x - c} < 0 \Rightarrow x^2 - 2x + c < 0 \Rightarrow (x-1)(x-c) < 0$<br>$\Rightarrow D_f = \mathbb{R} - [1, c]$                                                                                    | الف                                                              |    |
| $\frac{x+c}{x-1} < 0 \Rightarrow x+c < 0 \Rightarrow x < -c$<br>$x+c < 0 \Rightarrow x < -c$<br>$x+c \neq 1 \Rightarrow x \neq 1-c$                                                                                    | ب<br>$D_f = (-\infty, -\frac{c}{2}) \cup (1, +\infty) - \{1-c\}$ | ٧  |
| $x - 2 < 0 \Rightarrow x < 2, x - 2 < 1 \Rightarrow x < 1 \Rightarrow D_f = (2, 1.0]$                                                                                                                                  | الف                                                              |    |
| $2 \log_e x - 1 < 0 \Rightarrow \log_e x > \frac{1}{2} \Rightarrow x > \sqrt{e} \Rightarrow D_f = (\sqrt{e}, +\infty)$                                                                                                 | ب                                                                | ٨  |
| $x \neq 1 \neq 0 \Rightarrow D = \mathbb{R}$<br>$x \neq 1 \neq 0 \Rightarrow x \neq 0 \Rightarrow D = \mathbb{R} - \{0\}$<br>$D_f = \mathbb{R} - \{\frac{1}{2}\}$<br>$D_f = \mathbb{R} - \{\log_e c\}$                 | الف<br>ب<br>ج<br>د                                               | ٩  |
| $x+1 < 0 \Rightarrow x+1 \in \mathbb{Z} \Rightarrow x = \frac{k-1}{2} \Rightarrow k \in \mathbb{W}$<br>$\Rightarrow D_f = \{-\frac{1}{2}, 0, \frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2}, \frac{9}{2}, \dots\}$ | الف                                                              |    |
| $\frac{cx-1}{x-a} \in \mathbb{W}, x \neq \frac{a}{c} \Rightarrow D_f = \{x \in \mathbb{R} \mid \frac{cx-1}{x-a} \in \mathbb{W}, x \neq \frac{a}{c}\}$                                                                  | ب                                                                | ١٠ |