

الف) $x^3 - 4x^2 \neq 0 \quad x^2(x-4) \quad \mathbb{R} - \{0, 4\}$ (د)

ب) $x^3 + 4x^2 + 4x + 4 \neq 0 \quad x^2(x+4) + (4x+4) \neq 0$
 $(x+4)(x^2+1) \neq 0 \quad \mathbb{R} - \{-4\}$

الف) $x^2 - 1 \geq 0 \quad x^2 \geq 1 \quad \boxed{x \geq 1 \quad x \leq -1}$ (د)
 $x - 2 \geq 0 \quad \boxed{x \geq 2} \rightarrow \underline{x \geq 2}$

ب) $4 - 3x \geq 0 \quad 4 \geq 3x \quad 2 \geq x \quad (\frac{1}{3}, 2]$
 $4x - 3 > 0 \quad 4x > 3 \quad x > \frac{3}{4}$

$4x - a \geq 0 \quad 4x \geq a \quad x \geq \frac{a}{4}$
 $b - 3x \geq 0 \quad b \geq 3x \quad \frac{b}{3} \geq x$ } $\begin{cases} a=12 \\ b=4 \end{cases} \Rightarrow \underline{\frac{4}{12} = \frac{1}{3}}$ (د)

الف) $\frac{(x-3)(x+2)}{(x^2-9)(x^2-4)} \xrightarrow{(3)} \frac{(x-3)(x+2)}{(x-3)(x+3)(x-2)(x+2)} \xrightarrow{(2)} \frac{1}{(x+3)(x-2)}$ (د)
 $\frac{-3}{-2} \frac{2}{3} \xrightarrow{+} + \frac{1}{x+3} - \frac{1}{x-2} +$ $(-\infty, -3) \cup (2, +\infty) - \{3\}$

ب) $x^3 - 2x^2 - 5x + 4 \mid x-1$
 $x^3 + 2x^2 - 5x - 4 \mid x+1$
 $x^2 + x - 4 \Rightarrow (x+3)(x-2)$

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

Sol 8 $D_f = (-\infty, -3) \cup [-2, -1] \cup [1, 2) \cup [3, +\infty)$

$$\text{الف) } 2[x] - 4 \geq 0 \quad [x] \geq 2 \quad [2, +\infty) \quad (9)$$

$$\text{ب) } 2[x] - 5 \geq 0 \quad [x] \geq 2.5 \quad [3, +\infty)$$

$$\text{الف) } \frac{x+1}{1x-3} \geq -1 \quad \begin{array}{r} -1 \quad 3 \\ -1 + 3 + \end{array} \quad (10)$$

$$\frac{4-x}{1x-3} \geq 4 \quad \begin{array}{r} 4 \\ +1 - \end{array} \quad \Rightarrow [-1, 4] - \{3\}$$

$$\Delta < 0 \quad \checkmark$$

$$\text{ب) } [x] - 4 \geq 0 \quad [x] \geq 4 \quad [4, +\infty) \quad \Rightarrow \emptyset$$

$$2 - [x] \geq 0 \quad 2 \geq [x] \quad (-\infty, 3)$$