

الف)
$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \\ -2x^3 + 2x^2 \\ \hline 5x^2 - 8x + 3 \\ -5x^2 + 5x \\ \hline -3x + 3 \\ +3x - 3 \\ \hline 0 \end{array} \quad \begin{array}{l} x-1 \\ 2x^2 + 5x - 3 \end{array} \Rightarrow 2x^3 + 3x^2 - 8x + 3 = (x-1)(2x^2 + 5x - 3)$$

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

جواب: قسمت ۱ در پشت صفحه *

الف)
$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \\ -x^3 + x^2 \\ \hline -x^2 + 2x - 1 \\ +x^2 - x \\ \hline x - 1 \\ -x + 1 \\ \hline 0 \end{array} \quad \begin{array}{l} x-1 \\ x^2 - x + 1 \end{array} \Rightarrow x^3 - 2x^2 + 2x - 1 = (x-1)(x^2 - x + 1)$$

$\Delta < 0 \Rightarrow$ ریشه حقیقی ندارد.

$D_f = \mathbb{R} - \{1\}$

جواب: قسمت ۲ در پشت صفحه *

اگر $x \geq 1 \Rightarrow x^2 - 2(x-1) - 2x + 5 = (x-2)(x-5) \Rightarrow$

اگر $x < 1 \Rightarrow x^2 - 2(1-x) - 2x + 5 = x^2 + 2x = x(x+2) \Rightarrow$

$D_f = \mathbb{R} - \{-5, 0, 2, 5\}$

الف) $[-x] - 2 \geq 0 \Rightarrow -x \geq 2 \Rightarrow x \leq -2 \Rightarrow D_f = (-\infty, -2]$

ب) $[x]^2 - 2[x] - 3 = ([x]-3)([x]+1)$

$[x]-3 \neq 0 \Rightarrow x \notin [3, 4)$

$[x]+1 \neq 0 \Rightarrow x \notin [-1, 0)$

$D_f = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$

الف) $[x - \frac{1}{3}] + [x + \frac{2}{3}] = [x - \frac{1}{3}] + [x - \frac{1}{3} + 1] =$

$[x - \frac{1}{3}] + 1 \Rightarrow 2[x - \frac{1}{3}] + 1 \geq 0 \Rightarrow [x - \frac{1}{3}] \geq -\frac{1}{2}$

$\Rightarrow x - \frac{1}{3} \geq 0 \Rightarrow x \geq \frac{1}{3} \Rightarrow D_f = [\frac{1}{3}, +\infty)$

جواب: قسمت ۳ در پشت صفحه *

جواب قسمت (ب) سؤال ١ *

$$\begin{array}{r|l} 2x^3 + 9x^2 + 10x + 3 & x+1 \\ -2x^3 - 2x^2 & \\ \hline 7x^2 + 10x + 3 & \\ -7x^2 - 7x & \\ \hline 3x + 3 & \\ -3x - 3 & \\ \hline 0 & \end{array} \Rightarrow 2x^3 + 9x^2 + 10x + 3 = (x+1)(x+2)(2x+1)$$

$$\Rightarrow D_f = \mathbb{R} \setminus \left\{ -\frac{3}{2}, -1, -\frac{1}{2} \right\}$$

جواب قسمت (ب) سؤال ٢ *

$$x^3 - 2x^2 + 2x - 1 = (x-1)(x^2 - x + 1) \Rightarrow \frac{x}{p(x)} \quad \begin{array}{c} -3 \\ + \quad \phi \quad - \quad \phi \quad + \end{array}$$

$\Delta < 0 \Rightarrow$ ریشه های حقیقی ندارد

$$\Rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$$

جواب قسمت (ب) سؤال ٥ *

$$\left[x - \frac{1}{p} \right] + \left[\frac{1}{p} - x \right] = \left[x - \frac{1}{p} \right] + \left[-\left(x - \frac{1}{p} \right) \right] \xrightarrow{x - \frac{1}{p} = w}$$

$$[w] + [-w] \geq 0 \Rightarrow \begin{cases} \text{if } w \in \mathbb{Z} \Rightarrow [w] + [-w] = 0 \checkmark \\ \text{if } w \notin \mathbb{Z} \Rightarrow [w] + [-w] = -1 \times \end{cases}$$

$$\Rightarrow w \in \mathbb{Z} \Rightarrow x - \frac{1}{p} \in \mathbb{Z} \Rightarrow D_f = \left\{ x \mid x = k + \frac{1}{p}, k \in \mathbb{Z} \right\}$$

الف) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$, $\sin x \neq 0 \Rightarrow$
 $D_f = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi - \frac{\pi}{4} \right\}$  , $\cos x \neq 0$

ب) $1 - \sqrt{\sin^2 x} \geq 0 \Rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2} \Rightarrow$
 $D_f = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right]$ 

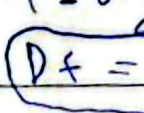
الف) $\sqrt{\sin x} - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{4} \Rightarrow D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$ 

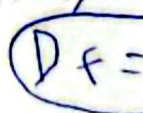
ب) $1 - \sqrt{\cos x} \geq 0 \Rightarrow \cos x \leq \frac{1}{4} \Rightarrow D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right]$ 

الف) $-1 \leq x^2 + x + 1 \leq 1 \Rightarrow \begin{cases} x^2 + x \leq 0 \Rightarrow x(x+1) \leq 0 \\ x^2 + x + 2 \geq 0 \Rightarrow (x+1/2)^2 + 7/4 \geq 0 \end{cases}$
 $\Rightarrow D_f = [-1, 0] \cup [-1, \infty)$ 

ب) $\sqrt{2-x} \geq 0 \Rightarrow x \leq 2$ ①
 $-1 \leq \sqrt{2-x} \leq 1 \Rightarrow \sqrt{2-x} \leq 1 \Rightarrow x \geq 1$ ②

فصل اوله برقرار
 الف) $x > 0$ ① $1 - \log_x x > 0 \Rightarrow \log_x x < 1 \Rightarrow x < x^x$ ②
 $\Rightarrow D_f = (0, x^x)$ 

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

الف) $x^2 - x^2 = a \Rightarrow x^2 - a \geq 0 \Rightarrow x^2 \geq a \Rightarrow a \geq x^2$
 $\Rightarrow x^2 - x^2 + x^2 \leq 0 \Rightarrow D_f = [1, x^2]$ 

ب) $\frac{x^2 + a}{x^2 + x} \in \mathbb{W} \Rightarrow x = -\frac{x^2 + a}{x^2 + x} = \frac{a - x^2}{x^2 + x}$
 $\Rightarrow D_f = \left\{ x \mid x = \frac{a - x^2}{x^2 + x}, k \in \mathbb{W} \right\}$ 