

الف)
$$\begin{array}{r|l} 2x^3 + 3x^2 - 8x + 3 & x-1 \\ \hline -2x^3 + 2x^2 & \\ \hline 5x^2 - 8x + 3 & \\ -5x^2 + 5x & \\ \hline -3x + 3 & \\ +3x - 3 & \\ \hline 0 & \end{array} \quad \Rightarrow \quad \begin{array}{l} 2x^3 + 3x^2 - 8x + 3 = (x-1)(x+3)(2x-1) \\ D_f = \mathbb{R} - \left\{-3, \frac{1}{2}, 1\right\} \end{array}$$

جواب: قسمت ۱ در پشت صفحه *

الف)
$$\begin{array}{r|l} x^3 - 2x^2 + 2x - 1 & x-1 \\ \hline -x^3 + x^2 & \\ \hline -x^2 + 2x - 1 & \\ +x^2 - x & \\ \hline x - 1 & \\ -x + 1 & \\ \hline 0 & \end{array} \quad \Rightarrow \quad \begin{array}{l} x^3 - 2x^2 + 2x - 1 = (x-1)(x^2 - x + 1) \\ \Delta < 0 \Rightarrow \text{ریشه حقیقی ندارد.} \\ D_f = \mathbb{R} - \{1\} \end{array}$$

جواب: قسمت ۲ در پشت صفحه *

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

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

① و ②
$$D_f = \mathbb{R} - \{-3, 0, 2, 5\}$$

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

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

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

جواب: قسمت ۵ در پشت صفحه *

جواب قسمت (ب) سؤال ١ *

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

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

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) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$, $\sin x \neq 0 \Rightarrow$
 $D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{2} \right\}$  , $\cos x \neq 0$

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) $-1 \leq x^2 + x + 1 \leq 1 \Rightarrow$
 $\textcircled{1} \text{ and } \textcircled{2} \Rightarrow D_f = [-2, -1] \cup [-1, 0]$ $x^2 + x \leq 0 \Rightarrow x(x+1) \leq 0$ $\textcircled{1}$
 $x^2 + x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0$ $\textcircled{2}$

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

فصل اوله برقرار
 الف) $x > 0$ $\textcircled{1}$ $1 - \log_{\frac{1}{2}} x > 0 \Rightarrow \log_{\frac{1}{2}} x < 1 \Rightarrow x < \frac{1}{2}$ $\textcircled{2}$
 $\textcircled{1} \text{ and } \textcircled{2} \Rightarrow D_f = (0, \frac{1}{2})$

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

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

ب) $\frac{wx+a}{x+a} \in \mathbb{W} \Rightarrow x = -\frac{\frac{1}{2}w+a}{\frac{1}{2}w-1} = \frac{a - \frac{1}{2}w}{\frac{1}{2}w-1}$
 $\Rightarrow D_f = \left\{ x \mid x = \frac{a - \frac{1}{2}k}{\frac{1}{2}k-1}, k \in \mathbb{W} \right\}$