

۱۹, ۵

بنیامین نوروزی - یازدهم پسر B - تکلیف شماره ۳

الف) $2x^3 + 3x^2 - 8x + 3 \neq 0$

$(x-1)(x+3)(x-\frac{1}{2}) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1, -3, \frac{1}{2}\}$ ✓

(۱)
$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \mid x-1 \\ \underline{-2x^3 + 2x^2 - 2x + 2} \\ 5x^2 - 6x + 1 \\ \underline{-5x^2 + 5x - 5} \\ x - 7 \\ \underline{-x + 7} \\ 0 \end{array}$$

(۲)
$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \mid x+\frac{1}{2} \\ \underline{-x^3 - \frac{1}{2}x^2 + 4x + \frac{3}{2}} \\ 3x^3 + \frac{5}{2}x^2 - 12x + \frac{3}{2} \\ \underline{-3x^3 - \frac{3}{2}x^2 + 12x + 3} \\ 4x^2 + 9x + \frac{9}{2} \\ \underline{-4x^2 - 6x - 9} \\ 5x + \frac{27}{2} \\ \underline{-5x - \frac{25}{2}} \\ x + 1 \end{array}$$

ب) $2x^2 + 9x^2 + 10x + 3 \neq 0$

$(x+1)(x+\frac{1}{2})(x+3) \neq 0 \Rightarrow D_f = \mathbb{R} - \{-1, -\frac{1}{2}, -3\}$ ✓

(۲)
$$\begin{array}{r} 2x^2 + 9x^2 + 10x + 3 \mid x+1 \\ \underline{-2x^2 - 2x - 2} \\ 11x + 1 \\ \underline{-11x - 11} \\ 12 \end{array}$$

(۲)
$$\begin{array}{r} 2x^2 + 9x^2 + 10x + 3 \mid x+\frac{1}{2} \\ \underline{-x^2 - \frac{1}{2}x - \frac{1}{2}} \\ 3x^2 + \frac{5}{2}x + \frac{3}{2} \\ \underline{-3x^2 - \frac{3}{2}x - \frac{9}{2}} \\ 4x + 6 \\ \underline{-4x - 2} \\ 8 \end{array}$$

الف) $x^3 - 2x^2 + 2x - 1 \neq 0$

$(x-1)(x^2+x+1) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1\}$ ✓

(۲)
$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \mid x-1 \\ \underline{-x^3 + x^2 - x + 1} \\ 3x^2 - 3x - 2 \\ \underline{-3x^2 + 3x + 3} \\ -5 \end{array}$$

ب) $\frac{x+3}{(x-1)(x^2+x+1)} \geq 0 \Rightarrow \frac{-3}{+ \phi - \frac{1}{\phi} +} D_f = (-\infty, -3] \cup (1, +\infty)$ ✓

$$\left. \begin{array}{l} x^2 - 5|x-1| - 2x + 5 \neq 0 \\ \begin{array}{l} x > 1 \Rightarrow x^2 - 7x + 6 \rightarrow (x-2)(x-3) \rightarrow x \neq 2, 3 \\ x < 1 \Rightarrow x^2 + 3x \rightarrow x(x+3) \rightarrow x \neq 0, -3 \\ x = 1 \Rightarrow x^2 - 2x + 5 \rightarrow 1 - 2 + 5 \rightarrow 4 \neq 0 \end{array} \end{array} \right\} D_f = \mathbb{R} - \{-3, 0, 2, 3\}$$
 ✓

الف) $|2x+1|^2 \neq |x+3|^2 \Rightarrow 4x^2 + 4x + 1 \neq x^2 + 6x + 9 \Rightarrow 3x^2 - 2x - 8 \neq 0 \Rightarrow (x-2)(3x+4) \neq 0 \Rightarrow x \neq 2, -\frac{4}{3}$

$D_f = \mathbb{R} - \{2, -\frac{4}{3}\}$ ✓

ب) $|2x+1|^2 \geq |x+3|^2 \Rightarrow 3x^2 - 2x - 8 \geq 0 \Rightarrow \frac{-\frac{2}{3} \pm \sqrt{\frac{4}{9} + 24}}{+ \phi - \phi +} \Rightarrow D_f = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$ ✓

الف) $x > 0$, $1 > \log_{\frac{1}{2}} x \Rightarrow \boxed{x > 2}$ $D_f = (0, 2)$ ✓

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

(2) (4)

$$\log_{\frac{1}{2}} \log_{\Delta} (2x-1) \geq 0 \Rightarrow 2x-1 > 0 \Rightarrow x > \frac{1}{2}$$

$$\log_{\Delta} (2x-1) > 0 \Rightarrow 2x-1 > 1 \Rightarrow x > 1$$

$$\log_{\frac{1}{2}} \geq 0 \Rightarrow \log_{\Delta} (2x-1) \leq 1 \Rightarrow 2x-1 \leq \Delta \Rightarrow x \leq 3$$

$$D_f = (1, 3] \checkmark$$

الف) $2 \cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2}$  $\Rightarrow D_f = (2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3}) \checkmark$ (2) (7)

ب) $\log_{\frac{x-1}{x+1}} \geq 0 \Rightarrow \frac{x-1}{x+1} > 0 \Rightarrow \frac{-1}{+\frac{1}{-1} - \frac{1}{+1}} \rightarrow I: (-\infty, -1) \cup (1, +\infty)$

II: $\frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{x-1-x-1}{x+1} \geq 0 \Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow \frac{-1}{+\frac{1}{-1} - \frac{1}{+1}} \rightarrow II: (-\infty, -1)$

$$D_f = I \cap II = (-\infty, -1) \checkmark$$

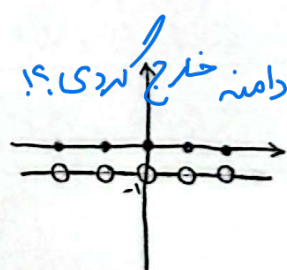
از آنجا که در ازای $a < -2$ میسر نمی‌داریم شد پس $[-\infty, 3]$ دامنه آن نخواهد بود. پس می‌توان نتیجه گیری کرد که تابع از نوع خطی می‌باشد پس $a = -2$ باشد.

$$-2x + b \geq 0 \Rightarrow b \geq 2x \Rightarrow \frac{b}{2} \geq x \mid \begin{matrix} 3 \geq x \\ \text{نقطه سبیل} \end{matrix} \Rightarrow b = 6 \checkmark$$

$$\frac{x^2 + 2x + 2 - m^2}{x^2 + 2x + 2} \geq 0 \quad D_f = \mathbb{R}$$

همواره $\oplus$ باشد $\Rightarrow b^2 - 4ac \leq 0 \Rightarrow 4 - 4(2 - m^2) = 4 - 8 + 4m^2 \leq 0 \Rightarrow m^2 \leq \frac{4}{4} \Rightarrow m^2 \leq 1 \Rightarrow -1 \leq m \leq 1$

$$\Rightarrow |-1-1| = 2 \checkmark$$

اعداد صحیح را از دامنه خارج کردی؟  $D_f = \mathbb{Z}$

$$-x^2 \geq 0 \Rightarrow x^2 \leq 0 \Rightarrow -2 \leq x \leq 2 = I$$

$$[x] + [-x] + 1 \neq 0 \Rightarrow [x] + [-x] \neq -1$$

$x \in \mathbb{Z} \rightarrow 0$
 $x \in \mathbb{Z} \rightarrow -1$

$$I \cap II = D_f = \{-2, -1, 0, 1, 2\} \Rightarrow \text{مجموعه صحیح} \checkmark$$