

بنیامین نوروزی - یازدهم پسر B - تکلیف شماره ۳

الف) $2x^3 + 3x^2 - 8x + 3 \neq 0$

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

ب) $2x^3 + 9x^2 + 10x + 3 \neq 0$

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

①

$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \quad | \quad 2x-1 \\ \underline{-2x^3 + x^2} \\ 4x^2 - 8x + 3 \\ \underline{-4x^2 + 8x} \\ -5x + 3 \\ \underline{-5x + 5} \\ -2 \end{array}$$

$$\begin{array}{r} 2x^3 + 9x^2 + 10x + 3 \quad | \quad x+1 \\ \underline{-2x^3 + 2x^2} \\ 11x^2 + 10x + 3 \\ \underline{-11x^2 + 11x} \\ -x + 3 \\ \underline{-x + 1} \\ 2 \end{array}$$

$$\begin{array}{r} 2x^3 + 9x^2 + 10x + 3 \quad | \quad x+\frac{1}{2} \\ \underline{-2x^3 + x^2} \\ 10x^2 + 10x + 3 \\ \underline{-10x^2 + 5x} \\ 5x + 3 \\ \underline{-5x + \frac{5}{2}} \\ \frac{11}{2} \end{array}$$

الف) $x^3 - 2x^2 + 2x - 1 \neq 0$

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

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

②

$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \quad | \quad x-1 \\ \underline{-x^3 + 2x^2} \\ 4x - 1 \\ \underline{-4x + 4} \\ -3 \end{array}$$

$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \quad | \quad x^2+x+1 \\ \underline{-x^3 + x^2 + x + 1} \\ -3x^2 + x - 2 \\ \underline{+3x^2 + 3x + 3} \\ 4x + 1 \end{array}$$

③

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

④

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

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

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

⑤

الف) $\boxed{x > 0}$, $1 > \log_{\frac{1}{2}} x \Rightarrow \boxed{3 > x} \quad D_f = (0, 3)$

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

6

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

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

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

$$D_f = (1, 3]$$

7

الف) $2\cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2}$



$$D_f = (2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3}) \cup (2k\pi + \frac{5\pi}{3}, 2k\pi + \frac{7\pi}{3})$$

ب) $\log_{\frac{x-1}{x+1}} \geq 0 \Rightarrow \frac{x-1}{x+1} > 0 \Rightarrow \frac{-1}{+\frac{1}{2}} - \frac{1}{-1} \rightarrow I: (-\infty, -1) \cup (1, +\infty)$

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

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

8

از آنجا که در ازای $a < -2$ می شود پس $[-\infty, 3]$ دامنه آن نخواهد بود.

پس می توان نتیجه گیری کرد که تابع از نوع خطی می باشد پس $a = -2$ باشد.

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

9

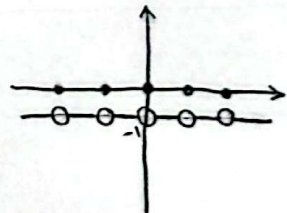
$$\frac{x^2 + 2x + 2 - m^2}{x^2 + 2x + 2} \geq 0 \quad D_f = \mathbb{R}$$

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

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

10

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

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


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