آزمون ریاضی
یازدهم پیشنهادی
اختری
تألیف ۳/۲

(۱)

الف) $2x^3+3x^2-8x+3 \to$ مخرج صفر، مخرج برابر صفر، مخرج برابر $x-1$

$$\begin{array}{l|l} 2x^3+3x^2-8x+3 & x-1 \\ \hline 2x^3-2x^2 & 2x^2+5x-3 \\ \hline 5x^2-8x+3 & \\ 5x^2-5x & \\ \hline -3x+3 & \end{array}$$

$\hookrightarrow (2x-1)(x+3)$

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

ب) $2x^3+9x^2+10x+3 \to$ مخرج برابر $x+1$

$$\begin{array}{l|l} 2x^3+9x^2+10x+3 & x+1 \\ \hline 2x^3+2x^2 & 2x^2+7x+3 \\ \hline 7x^2+10x+3 & \\ 7x^2+7x & \\ \hline 3x+3 & \end{array}$$

$\hookrightarrow (2x+1)(x+3)$

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

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الف) $D_f = R-\{1\}$

$$\frac{x+3}{(x-1)(x^2-x+1)}$$

همیشه +

$$\begin{array}{l|l} x^3-2x^2+2x-1 & x-1 \\ \hline x^3-x^2 & x^2-x+1 \\ \hline -x^2+2x-1 & \\ -x^2+x & \\ \hline x-1 & \end{array}$$

$\hookrightarrow \Delta < 0$

ب) $\dfrac{x+3}{(x-1)(x^2-x+1)} \geq 0$

	-3		1	
+		−		+

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

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$x^2-5|x-1|-2x+5=0$ ($-5(1-x)$)

$\to x \geq 1 \to x^2-5x+5-2x+5=0 \quad x^2-7x+10=0 \to x=2, x=5$

$\to x \leq 1 \to x^2 \cancel{-5}+5x-2x\cancel{+5}=0 \to x^2=-3x$

$\boxed{x=-3}$ ✓ $\boxed{x=0}$ ✓

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

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الف) $[-x]-2 \geq 0 \to [-x] \geq 2 \to -x \geq 2 \to \boxed{x \leq -2} \quad D_f = (-\infty, -2]$

ب) $[x]^2-2[x]-3 \leq 0$

$\to [x]=-1 \to -1 \leq x < 0$

$\to [x] \leq 3 \to 3 \leq x < 4$

$D_f = R-\{[-1, 0) \cup [3, 4)\} =$

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

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الف) $[x-\frac{1}{3}]+[x+1-\frac{1}{3}] = [x-\frac{1}{3}]+[x-\frac{1}{3}]+1 \geq 0$

$[x-\frac{1}{3}] = a$

$2a+1 \geq 0 \to a \geq -\frac{1}{2}$

$[x-\frac{1}{3}] \geq -\frac{1}{2} \to x-\frac{1}{3} \geq 0 \to x \geq \frac{1}{3} \quad D_f = [\frac{1}{3}, +\infty)$

ب) $[a]+[-a] \geq 0 \to a \in Z \to x-\frac{1}{3} \in Z \to x \in Z+\frac{1}{3} \quad D_f = \{x \mid x = k+\frac{1}{3}, k \in Z\}$

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الف) $D_f = R-\{\frac{k\pi}{2}, k\pi+\frac{3\pi}{4}\}$

یا $k\pi-\frac{\pi}{4}$

ب) $1-4\sin^2 x \geq 0 \to \sin^2 x \leq \frac{1}{4} \to -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

$\hookrightarrow D_f = [k\pi-\frac{\pi}{6}, k\pi+\frac{\pi}{6}]$

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

ب) $1-2\cos x \geq 0 \to \cos x \leq \frac{1}{2} \to D_f =$

$R-[2k\pi-\frac{\pi}{3}, 2k\pi+\frac{\pi}{3}]$

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الف) $x^2+3x+1 \to -1 \le x^2+3x+1 \le 1$

$x^2+5x+2 \ge 0$ $\quad x^2+5x \le 0 \to D_f = [-1,0] \cup [-3,-2]$

ب) $\sqrt{5-2x} \le 1 \to 5-2x \le 1 \to -5 \le -2x \le -4 \to D_f = [2, \frac{5}{2}]$

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الف) $1-\log_3^x > 0 \to \log_3^x < 1 \to x < 3 \quad D_f = (0,3)$ $\quad (x>0)$

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

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الف) $2^{4x-x^2} - 8 \ge 0 \to 2^{4x-x^2} \ge 2^3 \to 4x-x^2 \ge 3$

$-x^2+4x-3 \ge 0 \to x \le 1$, $x \ge 3$ $\to D_f = [1,3]$

ب) $\frac{3x+5}{2x+k} \in W \to \frac{-4W+5}{2W-3} = x \quad D_f = \{x \mid x = \frac{-4k+5}{2k-3}, k \in W\}$