

الف) ① $x > 0, x \neq 1$ ② $x > 1 \Rightarrow x > \frac{1}{x}$ ③ $\log_{x-1} x > 0 \Rightarrow x-1 > 1 \Rightarrow x > 2$ (crossed out) $\rightarrow x < \frac{1}{x-1}$ ④ $\log_{x-1} x < 0 \Rightarrow x-1 < 1 \Rightarrow x < 2$ (crossed out) $\rightarrow x > \frac{1}{x-1}$ ⑤ $\log_{x-1} x = 0 \Rightarrow x-1 = 1 \Rightarrow x = 2$ (crossed out) ① $\cap$ ②: $(\frac{1}{x}, 0) \cup (1, 2)$ ③ $\rightarrow x > \frac{1}{x}$ ① $\cap$ ④ $\cap$ ⑤ $\cup$ (① $\cap$ ② $\cap$ ③): $(\frac{1}{x}, \frac{1}{x}) \cup (1, 2)$ $\xrightarrow{x \neq 0} (-9, 9)$	ب) $4 + \sqrt{12x} - x > 0$ $\rightarrow -t^2 + t + 4 > 0 \Rightarrow \frac{-1 \pm \sqrt{1+16}}{-2} = \frac{-1 \pm \sqrt{17}}{-2}$ $-1 < x < 2 \xrightarrow{+} 0 < \sqrt{12x} < 3$ $\rightarrow 0 < x < 9 \rightarrow (-9, 9)$ $x \neq 0 \checkmark \rightarrow (-9, 9)$	① $\frac{x+2}{x+b} + a > 0, x+b \neq 0 \rightarrow x \neq b$ $\Rightarrow$ به ازای x و b متغیر نمی شود ① زیر $\frac{1}{x+b} < a$ (مطلوب) ② زیر $x+b=0 \rightarrow b=-2 \checkmark$ (منفرجه)	① $[x] > 4 \rightarrow x > 5 \xrightarrow{\text{تقریب}} x > 0$ ② $[x] \leq 4 \rightarrow x < 5 \rightarrow x+4 \rightarrow x > -\frac{4}{5}$ $\Rightarrow [-\frac{4}{5}, +\infty)$	$\frac{x(12x^3 + 12x^2 + 6x + 1)}{((2x+1)^2)^2} = \frac{x(2x+1)^3}{(2x+1)^4} = \frac{x}{2x+1}$ $2x \neq -1 \Rightarrow x \neq -\frac{1}{2} \mid D_f = \mathbb{R} - \{-\frac{1}{2}\}$	① $\log_{10} (2x-a) \leq 1 \Rightarrow 2x-a \leq 10 \rightarrow 2x \leq 10+a \rightarrow x \leq \frac{10+a}{2}$ ② $2x-a > 0 \Rightarrow x > \frac{a}{2} \Rightarrow b$ $\frac{10+a}{2} - \frac{a}{2} = [5]$ امیرعلی عباسی
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