

الف) $y = \frac{x+3}{2x^2+3x-11x+3} = \frac{(x+3)}{(x-1)(2x^2+5x-3)} = \frac{(x+3)}{(x-1)(x-\frac{1}{2})(2x+3)}$ (1)

$= \frac{1}{(x-1)(x-\frac{1}{2})} \neq 0 \rightarrow D = R - \{1, \frac{1}{2}, -\frac{3}{2}\}$ (5)

ب) $y = \frac{x+3}{2x^2+9x+10x+3} = \frac{x+3}{(x+1)(2x^2+11x+3)} = \frac{x+3}{(x+1)(x+\frac{1}{2})(2x+3)} \neq 0$

$D = R - \{-1, -\frac{1}{2}, -\frac{3}{2}\}$

الف) $y = \frac{x+3}{x^2-2x^2+2x-1} \rightarrow (x-1)(x^2-x+1) = 0 \rightarrow D = R - \{1\}$ (5)

$\Delta < 0$ همیشه مثبت

ب) $y = \sqrt{\frac{x+3}{x^2-2x^2+2x-1}} \geq 0 \rightarrow x+3=0 \rightarrow x=-3$

$x^2-2x^2+2x-1=0 \rightarrow (x-1)(x^2-x+1)=0$

$x=1$ مخرج صفر

$D = (-\infty, -3] \cup (1, +\infty)$

$y = \frac{2}{x^2-2|x-1|-2x+2}$

$|x+1| = \begin{cases} x+1 & x \geq 1 \\ -(x+1) & x < 1 \end{cases}$

$x \geq 1 \rightarrow x^2-2|x-1|-2x+2 = x^2-2(x-1)-2x+2 = x^2-2x+2-2x+2 = x^2-4x+4 = (x-2)^2 = 0 \rightarrow x=2$

$(x-2)(x-2)=0 \rightarrow x=2, 2$

$x < 1 \rightarrow x^2+2(x-1)-2x+2 = x^2+2x-2-2x+2 = x^2 = 0 \rightarrow x=0$

$D = R - \{0, 2, 2\}$

الف) $y = \frac{x+3}{|2x+1|-|x+3|}$ (1)

$|2x+1|-|x+3| \geq 0 \rightarrow |2x+1| \geq |x+3|$

$2x+1 = \pm(x+3) \rightarrow \begin{cases} 2x+1 = x+3 \Rightarrow x=2 \\ 2x+1 = -(x+3) \Rightarrow 3x = -4 \Rightarrow x = -\frac{4}{3} \end{cases}$

$D = R - \{-\frac{4}{3}, 2\}$ (5)

ب) $y = \sqrt{|2x+1|-|x+3|} \geq 0 \rightarrow |2x+1| \geq |x+3|$

$\begin{cases} 2x+1 \geq x+3 \rightarrow x \geq 2 \\ 2x+1 \leq -(x+3) \Rightarrow 3x \leq -4 \Rightarrow x \leq -\frac{4}{3} \end{cases}$

$D = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$

الف) $y = \log_r (1 - \log_r^x)$ $\rightarrow \begin{cases} 1 - \log_r^x > 0 \rightarrow \log_r^x < 1 \rightarrow x < r \\ x > 0 \\ r > 0 \\ r \neq 1 \end{cases}$ $D = (0, r)$

ب) $y = \log_r (1 - \log_r^{\frac{x}{r}})$ $\rightarrow \begin{cases} 1 - \log_r^{\frac{x}{r}} > 0 \rightarrow \log_r^{\frac{x}{r}} < 1 \rightarrow \frac{x}{r} < r \\ r \neq 0 \\ r > 0 \end{cases}$ $D = (\frac{1}{r}, +\infty)$

$f(x) = \sqrt{\log_a (2x-1)}$ $\geq 0 \rightarrow \log_a (2x-1) \geq 1 \rightarrow 2x-1 \leq a \rightarrow x \leq \frac{a+1}{2}$
 ② $\log_a (2x-1) \geq 0 \rightarrow 2x-1 \geq 1 \rightarrow 2x \geq 2 \rightarrow x \geq 1$
 ③ $2x-1 > 0 \rightarrow 2x > 1 \rightarrow x > \frac{1}{2}$
 $D = [1, \frac{a+1}{2}]$

الف) $y = \log (2\cos x + 1)$ $\rightarrow 2\cos x + 1 > 0 \rightarrow 2\cos x > -1$
 $\cos x > -\frac{1}{2}$
 $\cos x = -\frac{1}{2} \rightarrow x = \frac{2\pi}{3}, \frac{4\pi}{3}$
 $\cos x > -\frac{1}{2} \rightarrow x \in (-\frac{2\pi}{3}, \frac{2\pi}{3})$
 ب) $y = \sqrt{\log \frac{x-1}{x+1}}$ $\geq 0 \rightarrow \frac{x-1}{x+1} \geq 1 \rightarrow \frac{x-1}{x+1} - 1 \geq 0 \rightarrow \frac{x-1-(x+1)}{x+1} = \frac{-2}{x+1} \geq 0 \Rightarrow x+1 < 0 \rightarrow x < -1 \rightarrow (-\infty, -1)$

$f(x) = \sqrt{(a+2)x^2 + ax + b} \geq 0$ چون دامنه عبارت زیر رادیکال $(-\infty, \frac{1}{2}]$ است
 سین دهانه سهمی رو به پایین و $a+2 < 0$ است
 بیشترین مقدار در $x = \frac{1}{2}$ اتفاق می افتد
 $(a+2)x^2 + ax + b = (a+2)(x - \frac{1}{2})^2$
 $(a+2)x^2 + ax + b = (a+2)x^2 - 4(a+2)x + 4(a+2) \rightarrow$
 $-4a + 12 = a \rightarrow a = -\frac{12}{5} \neq -2$ $\rightarrow a+2 = 0 \rightarrow a = -2$
 عبارت زیر رادیکال فعلی است
 $ax + b \geq 0 \rightarrow -2x + b \geq 0 \rightarrow -2x \geq -b \rightarrow x \leq \frac{b}{2}$
 $D = (-\infty, \frac{b}{2}] \rightarrow \frac{b}{2} = \frac{1}{2} \Rightarrow b = 1$

$f(x) = \sqrt{x^2 + 2x + 1 - m^2} \geq 0 \rightarrow (x^2 + 2x + 1) + (1 - m^2) \geq 0 \rightarrow$
 $(x+1)^2 + (1 - m^2) \geq 0 \rightarrow 1 - m^2 \geq 0 \rightarrow \sqrt{m^2} \leq 1 \rightarrow |m| \leq 1 \rightarrow -1 \leq m \leq 1$
 $1 - (-1) = 2$

$$f(x) = \frac{\sqrt{r-x^2}}{[x] + [-x] + 1} \geq 0 \rightarrow \sqrt{r-x^2} \leq r \rightarrow |x| \leq r \rightarrow -r \leq x \leq r$$

$$[x] + [-x] + 1 \neq 0 \rightarrow [x] + [-x] \neq -1 \rightarrow [x] + [-x] = 0 \rightarrow x \in \mathbb{Z}$$

$$[x] + [-x] = \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases} \quad \mathbb{Z} \cap [-r, r] = [-r, r]$$

$$\{-r, -1, 0, 1, r\}$$

مصحح