

۲. اثبات خوب نوشتی

$$f(n) = \sqrt{(a-2)n^2 + an + b} \Rightarrow \sqrt{2n^2 + b}$$

$$D_f = [39 + \infty) \rightarrow \text{دامنه کسریها 0 درجه دوم نیست} \rightarrow (a-2)=0 \Rightarrow a=2$$

$$\Rightarrow f(3) = \sqrt{6 + b} = 0 \Rightarrow \sqrt{6+b} = 0 \Rightarrow b = -6$$

$$f(n) = \sqrt{2n^2 + 2n + 2 - m^2} \Rightarrow R \text{ زمانی دامنه } \Rightarrow 4 - 4(1)(2 - m^2) \leq 0$$

$$D_f = R \quad \Rightarrow 4m^2 - 4 \leq 0 \Rightarrow 4m^2 \leq 4 \Rightarrow m^2 \leq 1$$

$$\Rightarrow -1 \leq m \leq 1 \Rightarrow [1 - (-1) = 2]$$

$$f(n) = \frac{\sqrt{4 - n^2}}{[n] + [-n] + 1} \sim 4 - n^2 \geq 0 \Rightarrow 4 \geq n^2 \Rightarrow 2 \geq n \geq -2$$

$$[n] + [-n] + 1 \sim n \in \mathbb{Z} \rightarrow [n] + [-n] = 0$$

$$n \notin \mathbb{Z} \rightarrow [n] + [-n] = -1 \rightarrow \text{تقریب نشده}$$

$$D_f = [-2, 2] \sim -2, -1, 0, 1, 2 \rightarrow \text{تمام اعداد صحیح که در دامنه قرار دارند}$$

$$f(n) = \sqrt{n^3 + 3n^2} \Rightarrow n^3 \geq -3n^2 \Rightarrow n \geq -3$$

$$\Rightarrow D_f = [-3 + \infty)$$

$$f(n) = \sqrt{\frac{(n^2-1)(n^3-3n^2)}{n^3-1}} \rightarrow \frac{(n+1)(n-1)n^2(n-3)}{(n-1)(n^2+n+1)} \rightarrow \frac{n^2(n-3)}{n^2+n+1}$$

$$\Rightarrow D_f = (-\infty, -1] \cup [39 + \infty) \cup \{0\}$$

$$f(n) = \sqrt{n^2 - 1} \rightarrow (n-2) \geq 3 \Rightarrow n-2 \geq 3 \Rightarrow n \geq 5$$

$$n-2 \leq 3 \Rightarrow n \leq 5 \Rightarrow D_f = (-\infty, -1] \cup [59 + \infty)$$

$$f(n) = \sqrt{4 - 12 - 2n} \Rightarrow 4 \geq |2 - n| \Rightarrow -4 \geq -2 + n \Rightarrow -4 \leq n - 2 \leq 4$$

$$-2 \leq n \leq 6 \Rightarrow D_f = [-2, 6]$$

الف) $\sqrt{1-x^2} \rightarrow 1 \geq x \Rightarrow x \in [-1, 1] \Rightarrow x^2 \leq 1 \Rightarrow -1 \leq x \leq 1$ $x \in \mathbb{R} \setminus \{0\} \Rightarrow x \neq 0 \Rightarrow x \in (-\infty, 0) \cup (0, \infty)$ $\Rightarrow D_f = (-\infty, 0) \cup (0, 1] = (-\infty, 1] \setminus \{0\}$	6
ب) $y = \frac{1}{\sqrt{3- x-5 }}$ $\rightarrow 3- x-5 > 0 \Rightarrow x-5 < 3 \Rightarrow 2 < x < 8$ $\sqrt{3- x-5 } - 1 \neq 0 \Rightarrow \sqrt{3- x-5 } \neq 1 \Rightarrow 3- x-5 \neq 1 \Rightarrow x-5 \neq 2 \Rightarrow D_f = [2, 8] \setminus \{3, 7\}$	7
ج) $y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0 \Rightarrow x \neq k\pi + \frac{\pi}{2} \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2} \mid k \in \mathbb{Z}\}$	8
د) $y = \frac{\cos x}{2\cos x - 1} \rightarrow \cos x \neq 0 \Rightarrow 2\cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{2} \Rightarrow x \neq 2k\pi \pm \frac{\pi}{3}$ $\Rightarrow D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3} \mid k \in \mathbb{Z}\}$	9
هـ) $y = \frac{x+3}{ 2x+1 - x+3 } \rightarrow 2x+1 \neq x+3 \rightarrow (2x+1)^2 \neq (x+3)^2 \Rightarrow 3x^2 - 2x - 8 \neq 0$ $\Rightarrow x^2 - 2x - 24 = 0 \Rightarrow (x-6)(x+4) < 0 \Rightarrow x \in (-4, 6) \Rightarrow D_f = \mathbb{R} - \{-4, 6\}$	10
و) $y = \sqrt{ 2x+1 - x+3 } \rightarrow 2x+1 \geq x+3 \Rightarrow (2x+1)^2 \geq (x+3)^2 \Rightarrow 3x^2 - 2x - 8 \geq 0$ $\Rightarrow 3x^2 - 2x - 8 \geq 0 \Rightarrow (x-6)(x+4) \geq 0 \Rightarrow x \in (-\infty, -4] \cup [6, \infty)$	11
ز) $f(x) = \sqrt{\log_{0.5}^{(2x-1)}} \rightarrow (2x-1) > 0 \Rightarrow x > \frac{1}{2}$ $\log_{0.5}^{(2x-1)} \geq 0 \Rightarrow 0.5 \leq 2x-1 \Rightarrow 1.5 \leq 2x \Rightarrow x \geq 0.75$ $\Rightarrow D_f = [0.75, \infty)$	12
ح) $\log(2\cos x + 1) \sim 2\cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2}$ $D_f = \mathbb{R} - [2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}]$	13
ط) $\sqrt{\log \frac{x-1}{x+1}} \sim \frac{x-1}{x+1} > 0 \Rightarrow x > 1$ $\log \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{x-1-x-1}{x+1} \geq 0 \Rightarrow \frac{-2x-2}{x+1} \geq 0$ $x+1 < 0 \Rightarrow x < -1 \Rightarrow D_f = (-\infty, -1)$	14