

14, 25

$$y \gg 0 \rightarrow y-1=x \rightarrow y = \frac{x+1}{y} \rightarrow \frac{x+1}{y} \gg 0 \quad x \in [-1, +\infty) \quad (1)$$

$$y > 1 \rightarrow -y^2 = x \rightarrow y = \sqrt{-x} \quad x \in (-\infty, 0] \quad (2)$$

$$y = \begin{cases} \frac{x+1}{y} & x \gg -1 \\ \sqrt{-x} & x \leq -1 \end{cases}$$

تابع است زیرا برای x یک y داریم

$$g(x) = \sqrt{\frac{x - f(x-1)}{f(x)}}$$

$$\begin{array}{ccccccc} -1 & -1 & 0 & 1 & 2 & 3 & 4 \\ -\frac{1}{2} & -\frac{1}{2} & 0 & \frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & + \end{array}$$

$$D_g = (-1, -1] \cup [0, 1) \cup [2, +\infty) \quad (2)$$

فقط خواست باشد نه $x=4$ در دامنه است f و $x=2$ در دامنه $f(x-1)$ است نه باز به است افده نیست

$$f(x) = \frac{4x^2 - 3x + 2}{x(x^2 - 4)}$$

$$\begin{array}{ccc} -2 & 0 & +2 \\ -\frac{1}{2} & +\frac{1}{2} & -\frac{1}{2} & + \end{array}$$

$$D_f = \mathbb{R} - \{0, \pm 2\}$$

(3) الف

(2)

$$f(x) \gg 0 \rightarrow \begin{array}{ccc} -2 & 0 & 2 \\ -1 & +1 & -1 & + \end{array}$$

$$D_f = (-2, 0) \cup (0, +\infty) \quad (3)$$

$$\text{الف) } \sqrt{\frac{x-2}{(x^2-4)(x^2+2)}}$$

$$\begin{array}{ccc} -2 & 0 & 2 \\ -\frac{1}{2} & +\frac{1}{2} & -\frac{1}{2} & + \end{array}$$

$$D_f = (-2, +\infty) - \{2\} \quad (4)$$

خرج نباید منفی شود یعنی $D_f = \mathbb{R} - (-3, -2]$

$$\text{ب) } 2[-x] = 4 \rightarrow [-x] = 2 \quad 1 < -x < 3 \rightarrow -3 < x < -1$$

$$\begin{array}{ccc} -3 & -1 & 0 \\ -1 & 0 & + \end{array} \quad D_f = (-2, +\infty)$$

$$\text{الف) } \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}}$$

$$\text{I) } |x| \neq -x \rightarrow 0 < x < +\infty$$

$$\text{II) } \begin{array}{ccc} -1 & 0 & 1 \\ -1 & +1 & -1 & + \end{array}$$

$$D_f = [1, +\infty) \quad (5)$$

(2)

$$\text{ب) } \frac{\sqrt{|x-2|-x^2}}{|x|-1}$$

$$\text{I) } x \neq \pm 1$$

$$\text{II) } |x-2| \gg x^2$$

$$-2 < x < 1 \quad D_f = [-2, 1] - \{\pm 1\}$$

$$\text{الف) } \begin{array}{l} [x-2] = 0 \\ [x] = 2 \end{array} \quad (x-2) = 0 \rightarrow x = 2$$

$$\begin{array}{ccc} 2 & 0 & 2 \\ + & 0 & + \end{array}$$

$$D_f = \mathbb{R} \quad (6)$$

(2)

$$\text{ب) } \begin{array}{l} |x-1| = 0 \\ x = 1 \end{array} \quad [x] = 3 \quad 2 < x < 4$$

$$\begin{array}{ccc} 1 & 3 & 4 \\ -1 & + & 0 & + \end{array}$$

$$D_f = [3, +\infty) \cup \{1\} \quad (7)$$

$$||x-2|-1| = K \rightarrow K \gg 0 \rightarrow K = 0 \rightarrow ||x-2|-1| = 0 \rightarrow |x-2| = 1 \rightarrow x = 1, 3$$

$$\rightarrow K > 0 \rightarrow |x-2|-1 = K \rightarrow |x-2| = K+1 \rightarrow \begin{cases} x = 2+K \\ x = 1-K \end{cases}$$

$$\rightarrow |x-2|-1 = -K \rightarrow |x-2| = 1-K \rightarrow 1-K \gg 0 \rightarrow K < 1$$

$$\text{if } K=1 \rightarrow |x-2| = 0 \rightarrow x = 2$$

یعنی $K < 1$ و $K=1$ و $x=2$ و $x=1 \pm K$

✓ $K=1$ پس $x=2$ و $x=1 \pm K$

$$x \neq \begin{cases} \rightarrow 1 \\ \rightarrow -1 \\ \rightarrow \mu \end{cases} \quad \boxed{x = \mu} \quad x^2 - 4x + 4 = 0 \quad (x - \mu)^2 = 0 \quad \boxed{x = \mu} \quad \checkmark \quad \frac{1}{\mu} \quad \checkmark \quad \textcircled{1}$$

$$\left. \begin{array}{l} \text{I } x+1 > 0 \quad \checkmark \quad x > -1 \\ \text{II } x+1 \neq 1 \quad \checkmark \rightarrow x \neq 0 \\ \text{III } x > 0 \quad \checkmark \\ \text{IV } x \neq 1 \quad \checkmark \end{array} \right\} \xrightarrow{\wedge} D = (0, +\infty) \setminus \{1\} \quad D_f = (0, 1)$$

$$\lg \frac{1}{x} > 0 \rightarrow 0 < x < 1$$

$$D_{f(x)} = [-\mu, \mu] \rightarrow D_{f(x^2)} = [-\sqrt{\mu}, \sqrt{\mu}] \rightarrow D_{f(\frac{\sqrt{\mu}}{\mu})} = \left[-\frac{\sqrt{\mu}}{\mu}, \frac{\sqrt{\mu}}{\mu} \right] \rightarrow D_{f(\frac{\sqrt{\mu+1}}{\mu})} = \left[-\frac{\sqrt{\mu+1}}{\mu}, \frac{\sqrt{\mu+1}}{\mu} \right]$$

۱. دقتِ مسلم دامنه $f(n)$ یعنی معادری که تابع f می‌تونه بگیره پس $1 - n^2$ باید در بازه $[-5, 3]$ قرار بگیرد:

$$-5 \leq 1 - n^2 \leq 3 \rightarrow -4 \leq n^2 \leq 4 \rightarrow n^2 \leq 4 \rightarrow -\frac{4}{\sqrt{3}} \leq n \leq \frac{4}{\sqrt{3}}$$

$$\rightarrow -\frac{2\sqrt{3}}{3} \leq n \leq \frac{2\sqrt{3}}{3} \rightarrow D_{f(1-n^2)} = \left[-\frac{2\sqrt{3}}{3}, \frac{2\sqrt{3}}{3}\right]$$