

$$y \gg 0 \rightarrow y^3 - 1 = x \rightarrow y = \frac{x+1}{y^2} \rightarrow \frac{x+1}{y^2} \gg 0 \quad x \in [-1, +\infty) \quad (1)$$

$$y > 1 \rightarrow -y^3 = x \rightarrow y = \sqrt{-x} \quad x \in (-\infty, 0]$$

$$y = \begin{cases} \frac{x+1}{y^2} & x \gg -1 \\ \sqrt{-x} & x \leq -1 \end{cases}$$

تابع معکوس از تابع بالا

$$g(x) = \sqrt{\frac{x - f(x-1)}{f(x)}} \quad \begin{array}{c} -1 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \\ -\frac{1}{2} + \quad - \quad - \quad -\frac{1}{2} - \quad - \quad - \end{array} \quad D_g = (-1, -1] \cup [0, 1) \cup [2, +\infty) \quad (2)$$

$$f(x) = \frac{1-x^2 - x^3 + x^4}{x(x^2 - 1)} \quad \begin{array}{c} -1 \quad 0 \quad +1 \\ -\frac{1}{2} + \frac{1}{2} - \frac{1}{2} + \end{array} \quad D_f = \mathbb{R} - \{0, \pm 1\} \quad (3) \text{ الف}$$

$$f(x) \gg 0 \rightarrow \begin{array}{c} -1 \quad 0 \quad 1 \\ -1 + 1 - 1 + \end{array} \quad D_f = (-1, 0) \cup (1, +\infty) \quad (3) \text{ ب}$$

$$\text{الف)} \quad \sqrt{\frac{x-1}{(x^2-1)(x^2+1)}} \quad \begin{array}{c} -1 \quad 1 \\ -\frac{1}{2} + \frac{1}{2} + \end{array} \quad D_f = (-1, +\infty) - \{1\} \quad (4)$$

$$\text{ب)} \quad 1[-x] = 1 \rightarrow [-x] = 1 \quad 1 < -x < 3 \rightarrow -3 < x < -1 \quad \begin{array}{c} -1 \quad 1 \\ -1 \quad 0 \quad 1 + \end{array} \quad D_f = (-1, +\infty) \quad (5)$$

$$\text{الف)} \quad \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}} \quad \text{I} \quad |x| \neq -x \rightarrow 0 < x < +\infty \quad \text{II} \quad \begin{array}{c} -1 \quad 0 \quad 1 \\ -1 + 1 - 1 + \end{array} \quad [-1, 0] \cup [1, +\infty) \quad D_f = [1, +\infty) \quad (6)$$

$$\text{ب)} \quad \frac{\sqrt{|x-1|-x^2}}{|x|-1} \quad \text{I} \quad x \neq \pm 1 \quad \text{II} \quad \left. \begin{array}{l} |x-1| \gg x^2 \\ -1 < x < 1 \end{array} \right\} \text{I \& II: } D_f = [-1, 1] - \{\pm 1\} \quad (7)$$

$$\text{الف)} \quad \begin{array}{l} [x-1] = 0 \\ [x] = 1 \end{array} \quad \begin{array}{l} (x-1) = 0 \\ \hookrightarrow 1 \end{array} \quad \begin{array}{c} 1 \quad 1 \\ + \quad 0 \quad + \end{array} \quad D_f = \mathbb{R} \quad (8)$$

$$\text{ب)} \quad \begin{array}{l} |x-1| = 0 \\ x = 1 \end{array} \quad \begin{array}{l} [x] = 1 \\ 1 < x < 1 \end{array} \quad \begin{array}{c} 1 \quad 1 \quad 1 \\ - \quad 1 \quad 0 \quad + \end{array} \quad D_f = [1, +\infty) \cup \{1\} \quad (9)$$

$$||x-1|-1| = K \rightarrow K \gg 0 \rightarrow K = 0 \rightarrow ||x-1|-1| = 0 \rightarrow |x-1| = 1 \rightarrow x = 1 \text{ و } 3 \quad (10)$$

$$\hookrightarrow K > 0 \rightarrow |x-1|-1 = K \rightarrow |x-1| = K+1 \rightarrow \begin{cases} x = 3+K \\ x = 1-K \end{cases}$$

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

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

پس $K < 1$ و $K=1$ و $K=0$ جواب داریم

$$\boxed{K=1} \text{ پس } x \geq 0 \text{ و } 1 < x < 3 \text{ و } K=1 \text{ مجموعاً}$$

$$x \neq \begin{matrix} \nearrow 1 \\ \rightarrow -1 \\ \searrow \mu \end{matrix} \quad \boxed{x = \mu} \quad x^2 - 4x + 4 = 0 \quad (x - \mu)^2 = 0 \quad \boxed{x = \mu} \quad \frac{2}{\text{ans}} \quad \text{✓} \quad (1)$$

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

$$D_{f(x)} = [-5, \mu] \rightarrow D_{f(x^2)} = [-\sqrt{\mu}, \sqrt{\mu}] \rightarrow D_{f\left(\frac{\mu}{x^2}\right)} = \left[-\frac{\sqrt{\mu}}{\mu}, \frac{\sqrt{\mu}}{\mu} \right] \rightarrow D_{f\left(\frac{\mu}{x^2-1}\right)} = \left[-\frac{\sqrt{\mu+\mu}}{\mu}, \frac{\sqrt{\mu+\mu}}{\mu} \right] \quad (10)$$