

نام و نام خانوادگی: مبتنی: پاسخنامه تشریحی تکلیف شماره ۵۰ ... کلاس: A_1

$$f(x) = \sqrt{\frac{x-1}{x}} - \frac{x}{x-1} \rightarrow x-1 \neq 0 \rightarrow x \neq 1 / \frac{(x-1)}{x} \geq 0 \rightarrow x < 0 \vee x > 1$$

$$\rightarrow D: (-\infty, 0) \cup (1, +\infty)$$

$$b) f(x) = \frac{\frac{1}{x+1} - \frac{2}{x}}{\frac{2}{x-1} + \frac{1}{x+2}} \quad \frac{2}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow 2(x+2) + (x-1) \neq 0$$

$$x+3 \neq 0 \rightarrow x \neq -3$$

$$D: \mathbb{R} - \{-3, -\frac{5}{2}, -1, 0, 1\}$$

~~$$f(x) = \sqrt{\left(\frac{1}{x}\right)^2 - 9} (2x-5) \rightarrow \left(\frac{1}{x}\right)^2 - 9 \geq 0 \rightarrow \frac{1}{x^2} \geq 9 \rightarrow x^2 \leq \frac{1}{9} \rightarrow x \leq \frac{1}{3} \vee x \geq -\frac{1}{3}$$~~

$$2x-5 \geq 0 \rightarrow x \geq \frac{5}{2}$$

$$D: (-\infty, -\frac{1}{3}] \cup [\frac{5}{2}, +\infty)$$

$$b) \sqrt{x-1} + \sqrt{y+1} = 3$$

$$\sqrt{x-1} \geq 0 \quad 0 \leq \sqrt{x-1} \leq 3 \rightarrow 0 \leq x-1 \leq 9$$

$$D_x: [1, 10]$$

$$f(x) = \frac{\log_e (x^2 - x - 2)}{\sqrt{x^2 + 1}}$$

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

$$x^2 - 1 > 0 \rightarrow x < -1 \vee x > 1$$

$$D: (-\infty, -1) \cup (2, +\infty)$$

$$f(x) = \sqrt{1 + ax - x^2} \rightarrow -1 \rightarrow (-1)(b) = -1 \rightarrow b = \frac{1}{x}$$

$$a \rightarrow -1 + \frac{1}{x} = a \rightarrow a = -\frac{1}{x}$$

$$a + b = 1$$

$$f(x) = \begin{cases} x^2 - 2 & x > 1 \\ x + 2 & x < 1 \end{cases}$$

$$g(x) = \sqrt{f(x) - x} \rightarrow x > 1 \rightarrow x^2 - 2 - x \geq 0 \rightarrow x^2 - x - 2 \geq 0 \rightarrow x > 2 \rightarrow D: [2, +\infty)$$

$$x < 1 \rightarrow x + 2 - x \geq 0 \rightarrow 2 \geq 0 \rightarrow x < 1$$

$$f(x) = x^2 - 4x$$

$$f\left(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}\right) \rightarrow f\left(1 + \frac{\sqrt{2}}{2}\right) \rightarrow e^x = \frac{1}{e} + \ln$$

$$f(x) = x^2 - 4x = \left(\frac{1}{e} + \ln\right) - \left(\frac{1}{e} + \ln\right) = -\frac{1}{e}$$

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

$$a = ?$$

$$f(f(a)) = a$$

$$\rightarrow f(f(a)) = a \rightarrow \text{این تابع دایره وار است}$$

پس a می تواند هر عددی جز یک باشد

$$f(x) = x^2 - 4x$$

$$g(x) = \sqrt{x^2 - 1}$$

$$f(g(a)) = -4 \rightarrow g(a) = \sqrt{a^2 - 1} = 2$$

$$a = ?$$

$$f(x) = x^2 - 4x = -4 \rightarrow x^2 - 4x + 4 = 0 \rightarrow (x-2)^2 = 0 \rightarrow x = 2$$

$$\rightarrow \sqrt{a^2 - 1} = 2 \rightarrow a^2 = 5 \rightarrow a = \pm\sqrt{5}$$

$$f(x+y) = x^2 + 2xy + y^2$$

$$f(x) \neq f(-x)$$

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

$$f(-x) = 1 + 0 + 1 = 2$$

$$\rightarrow 2 \neq 2 = 1 \in \mathbb{R}$$

$$f(\cos \alpha + \sin \alpha) = \tan \alpha$$

$$f(r, \theta) \rightarrow f(\cos \alpha + \sin \alpha = r, \theta) \rightarrow \cos \alpha = \frac{r}{2}, \sin \alpha = \frac{\sqrt{3}r}{2}$$

$$\rightarrow \cos \alpha = \frac{1}{2} \rightarrow \alpha = \frac{\pi}{3} \rightarrow \tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$$

$$\rightarrow f(r, \theta) = r$$

$$\tan \alpha = (\sqrt{3})^2 = 3$$