

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱۸۷۵ کلاس یازدهم

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

$$\frac{0}{+} - \frac{1}{-} + \frac{1}{+} - \frac{1}{-} \Rightarrow D_f = (-\infty, 0) \cup \left(\frac{1}{2}, 1\right)$$

$$f(x) = \frac{1}{x+1} - \frac{x}{x} = \frac{1-x}{x+1} = \frac{-x-1}{x+1} \Rightarrow D_f = \mathbb{R} - \left\{1, -\frac{1}{2}, \frac{1}{2}, -1\right\}$$

$$f(x) = \sqrt{\left(\frac{1}{x} - 9\right)(x^2 - 4)} \quad \left(\frac{1}{x}\right)^2 = 9 \Rightarrow x = -\frac{1}{3}, \quad x^2 = 4 \Rightarrow x = \pm 2$$

$$\frac{1}{+} - \frac{9}{+} \times \frac{+}{+} - \frac{4}{+} \Rightarrow D_f = \mathbb{R} - \left(-\frac{1}{3}, 2\right)$$

باید ۲ تا فاکتور حاصل می‌گردد؟
 مجموع ۲ تا فاکتور می‌شود ۰ است $\Rightarrow$ $\sqrt{x-1} + \sqrt{y+1} = 0$
 $\sqrt{x-1} = 2 \Rightarrow x = 5, \sqrt{x-1} = 1 \Rightarrow x = 2, \sqrt{x-1} = 3 \Rightarrow x = 10, \sqrt{x-1} = 0 \Rightarrow x = 1$
 $\Rightarrow D_f = \{1, 2, 5, 10\}$ باید دو فاکتور داشته باشد؟

$$f(x) = \frac{\log(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1} \Rightarrow x^2 - x - 2 > 0 \quad \frac{-1 \pm 2}{+4 - 1} \quad \mathbb{R} - [-1, 2]$$

$$x^2 - 1 \geq 0 \Rightarrow \mathbb{R} - (-1, 1) \Rightarrow D_f = \mathbb{R} - [-1, 2]$$

$\sqrt{x^2 - 1} + 1 \neq 0$ همیشه

$$f(x) = \sqrt{x + a + x^2} \Rightarrow \frac{1}{0} - 8 - 0 = \sqrt{-2x - 1} \Rightarrow a = -\frac{1}{2}$$

$$\Rightarrow f(x) = \sqrt{-x^2 + \frac{1}{2}x + \frac{1}{2}} \Rightarrow \frac{+1/2 \pm \sqrt{1/4 - 1/4}}{-2} \Rightarrow x = -\frac{1}{2}, x = \frac{3}{2}$$

مقدار مثبت! $\Rightarrow a + b = +1$
 $b + a = \frac{3}{2} - \frac{1}{2} = 1$

$$f(x) = \begin{cases} 2x - 2 & x \geq 1 \\ 2x + c & x < 1 \end{cases} \quad g(x) = \sqrt{f(x) - x}$$

$$f(x) - x = 0 \Rightarrow f(x) = x \Rightarrow 2x - 2 = x \Rightarrow x = 2 \checkmark$$

$$2x + c = x \Rightarrow x = -c \checkmark$$

$$\frac{-2}{+} + \frac{1}{+} + \frac{1}{+} \Rightarrow D_f = [-2, \infty)$$

$$f(x) = x^2 - 2x \quad f\left(\sin \frac{\pi}{2} + \cos \frac{\pi}{2}\right) = f\left(\frac{\sqrt{2}}{2} + 1\right)$$

$$\Rightarrow f(x) = x(x-1) \Rightarrow f\left(\frac{\sqrt{2}}{2} + 1\right) = \frac{\sqrt{2}}{2} + 1 \left(\frac{\sqrt{2}}{2} - 1\right) = -\frac{1}{2}$$

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

$$f(f(x)) = \frac{\frac{x+1}{x-1} + 1}{\frac{x+1}{x-1} - 1} = \frac{\frac{x+1+x-1}{x-1}}{\frac{x+1-x+1}{x-1}} = \frac{2x}{2} = x \Rightarrow x=x \Rightarrow$$

این معادله را می توان به این روش حل کرد

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

$$f(g(x)) = -2 \Rightarrow f(g(x)) = x^2 - 2x = -2 \Rightarrow x^2 - 2x + 2 = 0 \Rightarrow x = 1$$

$$\Rightarrow g(x) = 2 \Rightarrow \sqrt{x^2 - 1} = 2 \Rightarrow x^2 - 1 = 4 \Rightarrow x = \pm \sqrt{5}$$

$$f(x+c) = x^2 - ax + 4$$

$$x+c = 2 \Rightarrow x = 1 \Rightarrow f(2) = 1^2 - a + 4 = 2$$

$$x+c = -2 \Rightarrow x = -4 \Rightarrow f(-2) = 4 - a + 4 = 4 \Rightarrow 4 - a + 4 = 4 \Rightarrow a = 4$$

$$\Rightarrow f(2) \times f(-2) = 2 \times 4 = 8$$

$$f(x \cos^2 u + a \cos u) = \tan^2 u$$

$$\Rightarrow x \cos^2 u + a \cos u = \frac{1}{2} \Rightarrow x \cos^2 u + a \cos u - \frac{1}{2} = 0$$

$$\cos u = \frac{1}{2} \Rightarrow u = 60^\circ = \frac{\pi}{3} \Rightarrow \tan^2 \frac{\pi}{3} = 3$$

ب-۲) $\sqrt[3]{x-1} + \sqrt{y+1} = 3$, $\underbrace{\sqrt{y+1}}_{\text{همواره نامنفی}} = \underbrace{3 - \sqrt[3]{x-1}}_{\text{همواره نامنفی!}} \rightarrow 3 - \sqrt[3]{x-1} \geq 0 \rightarrow \sqrt[3]{x-1} \leq 3 \rightarrow x \leq 28$

$\downarrow$
 $x-1 \geq 0 \rightarrow x \geq 1$ I

I, II $\rightarrow 1 \leq x \leq 28 \rightarrow Df = [1, 28]$

۴- ۲ و ۳ باید ریشه‌های عبارت زیر را بسازند بنابراین: $3 - 2(a) - (-2)^2 = 0 \rightarrow a = -\frac{1}{2}$

$f(x) = \sqrt{3 - \frac{x}{2} - x^2} \rightarrow -x^2 - \frac{x}{2} + 3 = 0 \rightarrow x = \left(\frac{1}{2} \pm \sqrt{\frac{1}{4} + 12}\right) \times -\frac{1}{2}$ $\begin{matrix} n = -2 \\ \hookrightarrow n = \frac{3}{2} \rightarrow b = \frac{3}{2} \end{matrix}$

$a + b = -\frac{1}{2} + \frac{3}{2} = 1$

$f(f(a)) = \frac{f(a)+1}{f(a)-1} = a \rightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{2a}{2} = a$ -V

$x \in Df \rightarrow x \in \mathbb{R} - \{1\}$

پس به ازای تمامی نقاط در دامنه‌ی f به‌تدریج است ✓