

نام و نام خانوادگی: پاسخنانه تشریحی تکلیف شماره: کلاس: یازدهم ریاضی دوم

الف $\rightarrow \sqrt{\frac{x-1}{x}} - \frac{n}{n-1}$ $x \in \mathbb{R} \setminus \{0, 1\}$ ب $\rightarrow \frac{1}{x+1} - \frac{2}{x-1}$ $D_f = \mathbb{R} \setminus \{-1, 0, 1, -2, -\frac{n}{4}\}$

$\frac{n-1}{n} - \frac{n}{n-1} \geq 0$ $D_f = (-\infty, -1) \cup (\frac{1}{4}, 1)$

$\frac{x+1-2n-x}{x(n-1)} \geq 0$ $\frac{1-2n}{n^2-n} \geq 0$ $\frac{1-2n}{n^2-n} \geq 0 \rightarrow 1-2n \geq 0 \rightarrow 1 \geq 2n \rightarrow \frac{1}{2} \geq n$

$\frac{1}{x(n-1)} > 0$ $\frac{1-2n}{n^2-n} > 0$ $\frac{1}{x(n-1)} > 0 \rightarrow \frac{1}{x} > 0$

حاصل $D_f = (-\infty, 0) \cup (0, 1)$

الف $\rightarrow ((\frac{1}{x})^n - 9)(x^2 - x^n) \geq 0$ $\frac{1}{x} = 3$ $x^2 = 9$ $x = 3$ $x = -3$

$(\frac{1}{x})^n = 9$ $x^2 = 9$ $x = 3$ $x = -3$

$\sqrt{y+1} = 3 - \sqrt{n-1}$ $y+1 = 9 + \sqrt{n-1} - 6\sqrt{n-1}$ $y = 8 + \sqrt{n-1} - 6\sqrt{n-1}$

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$y = (\sqrt{n-1} - 4)(\sqrt{n-1} - 2)$ $n-1 \geq 0 \rightarrow n \geq 1$ $D_f = [1, +\infty)$

$\log_f \frac{n^2-n-2}{(x-2)(n+1)} \geq 0$ $n^2-n-2 \geq 0$ $(x-2)(n+1) \geq 0$ $D_f = (-\infty, -1) \cup (2, +\infty)$

$\sqrt{n^2-1} + 1 = 0$ $\sqrt{n^2-1} = -1$ $n^2-1 \geq 0$ $(n-1)(n+1) \geq 0$ $D_f = (-\infty, -1) \cup (2, +\infty)$

$x^2 + ax - n^2 \geq 0$ $-(n^2 - ax - x) \geq 0$ $n^2 - ax - x \leq 0$ $(n+2)(n-\frac{x}{2}) \leq 0$

$\frac{x}{2} = \frac{2}{x} \rightarrow x^2 = 4 \rightarrow x = 2$ $\frac{x}{2} = \frac{2}{x} \rightarrow x^2 = 4 \rightarrow x = 2$

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$f(n) - n \geq 0$ $3n - 2 - n \geq 0$ $2n - 2 \geq 0$ $2(n-1) \geq 0$ $D_f = [1, +\infty)$

$2n + 3 - n \geq 0$ $n + 3 \geq 0$ $n \geq -3$ $D_f = [-3, +\infty)$

$$\sin \frac{\pi}{4} + \cos \frac{\pi}{4} =$$

$$\sin \frac{\pi}{4} + \cos \frac{\pi}{4} = \frac{\sqrt{2}}{2} + 1 = \frac{1+\sqrt{2}}{2}$$

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

$$\frac{1}{2} \left(\frac{1+\sqrt{2}}{2}\right)^2 - \frac{1}{2} \left(\frac{1+\sqrt{2}}{2}\right) = \frac{1+\sqrt{2}}{4} - \frac{1+\sqrt{2}}{4} = 0$$

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

$$f(?) = a$$

$$\frac{n+1}{n-1} = a \Rightarrow f\left(\frac{n+1}{n-1}\right) = a$$

$$? = f(a)$$

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

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

$$f(g(a)) = -\varepsilon$$

$$f(?) = -\varepsilon$$

$$n^2 - \varepsilon n = -\varepsilon$$

$$n^2 - \varepsilon n + \varepsilon = 0$$

$$(n-\varepsilon)^2 = 0 \rightarrow n = \varepsilon$$

$$\sqrt{n^2-1} = \varepsilon \rightarrow n^2-1 = \varepsilon^2 \rightarrow n^2 = \varepsilon^2 + 1$$

$$n = \pm \sqrt{\varepsilon^2 + 1}$$

$$g(a) = \varepsilon$$

$$\sqrt{n^2-1} = \varepsilon$$

$$\sqrt{(n-1)(n+1)} = \varepsilon \rightarrow (n-1)(n+1) = \varepsilon^2$$

$$a = \sqrt{\varepsilon^2 + 1}$$

$$n + \pi = 1 \rightarrow n = 1 - \pi$$

$$f(\varepsilon) = 1 - \pi + \pi = 1$$

$$n + \pi = -\pi \rightarrow n = -2\pi$$

$$f(-\pi) = \pi^2 + \pi + \pi = 2\pi$$

$$\sqrt{\pi^2 + \pi} = \pi$$

$$f \cos^2 u + a \cos u = \frac{1}{\sqrt{2}}$$

$$f \cos^2 u + a \cos u = \frac{1}{\sqrt{2}} = 0$$

$$f \cos^2 u + 1 \cdot \cos u - \frac{1}{\sqrt{2}} = 0$$

$$\cos^2 u + 1 \cdot \cos u - \frac{1}{\sqrt{2}} = 0$$

$$(\cos u + 1)(\cos u - \frac{1}{\sqrt{2}}) = 0$$

$$\cos u = -1 \text{ or } \cos u = \frac{1}{\sqrt{2}}$$

$$\cos u = \frac{1}{\sqrt{2}} \rightarrow u = \frac{\pi}{4}$$

$$\Rightarrow f\left(\frac{1}{\sqrt{2}}\right) = \tan^2 \frac{\pi}{4}$$

$$\Rightarrow \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{1}{2}$$

(الف-۱) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{-x+1}{x(x-1)} \geq 0$

$\frac{1}{x} - \frac{1}{x-1} \geq 0 \rightarrow D_f = (-\infty, 0) \cup [\frac{1}{2}, 1)$

(ب-۲) $\sqrt[4]{x-1} + \sqrt{y+1} = 3$ و $\sqrt{y+1} = 3 - \sqrt[4]{x-1} \rightarrow 3 - \sqrt[4]{x-1} \geq 0 \rightarrow \sqrt[4]{x-1} \leq 3 \rightarrow x \leq 82$

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

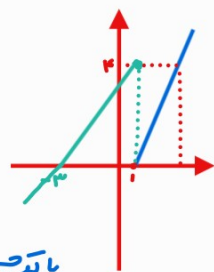
$I, II \rightarrow 1 \leq x \leq 82 \rightarrow D_f = [1, 82]$

$f(n) - n = \begin{cases} 3n-2-n & n \geq 1 \\ 3n+3-n & n < 1 \end{cases} = \begin{cases} 2n-2 & n \geq 1 \\ n+3 & n < 1 \end{cases}$

$f(n) - n \geq 0 \rightarrow \begin{cases} 2n-2 \geq 0 \rightarrow n \geq 1 \checkmark \\ n+3 \geq 0 \xrightarrow{n < 1} -3 \leq n < 1 \checkmark \end{cases}$

$\rightarrow D_f = [-3, +\infty)$

بالتوجه به شکل نیز مشخص است!



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(۴-۲) $3 - 2(a) - (-2)^2 = 0 \rightarrow a = -\frac{1}{4}$ $-2a - 1 = 0$

$f(n) = \sqrt{3 - \frac{n}{4} - n^2} \rightarrow -n^2 - \frac{n}{4} + \frac{3}{4} = 0 \rightarrow n = \left(\frac{1}{4} \pm \sqrt{\frac{1}{16} + \frac{3}{4}}\right) \times \frac{-1}{2}$ $n = -2$
 $\hookrightarrow n = \frac{3}{4} \rightarrow b = \frac{3}{4}$

$a+b = -\frac{1}{4} + \frac{3}{4} = \frac{1}{2}$

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$f(\star) = -2 \rightarrow \star^2 - 4\star = -2 \rightarrow (\star-2)^2 = 0 \rightarrow \star = 2 \checkmark$

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