

۱۷, ۵

نام و نام خانوادگی حسین حاجی حسینی پاسخنامه تشریحی تکلیف شماره ۹ کلاس B

$$\frac{\frac{\pi}{4}}{\frac{\pi}{4}} \times \frac{\pi}{4} = \frac{1}{4} \times \frac{\pi}{4} \Rightarrow \cot \frac{1}{4} \pi = \cot \pi = \frac{\sqrt{2}}{2}$$

$$\sqrt{2} \times 1 = 2 \quad \checkmark$$

(۲)

۱

$$f(g(x)) = ? \quad 2 \cos^2\left(\frac{\pi}{4}\right) = \frac{1}{2} \quad f(x) = \sqrt{\frac{x-1}{x}} = \frac{\sqrt{2}}{2} \quad \checkmark$$

(۲)

۲

$$g(\sqrt{2}) = \frac{\sqrt{2} - 1}{1 - \sqrt{2}} \approx -2, 0 \quad f(x) \Rightarrow [-2, 0] \approx -2 \quad \checkmark$$

$$\frac{\pi}{4} \Rightarrow \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2} \quad \frac{\sqrt{2}}{2} \sqrt{1 - \left(\frac{\sqrt{2}}{2}\right)^2} = \sqrt{1 - \frac{1}{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad \checkmark$$

(۱, ۷۵)

۳

$$g(x) = x \sqrt{1-x^2} \quad \text{دقت!}$$

$$\left. \begin{array}{l} \text{الف) } 4 \rightarrow 2 \rightarrow 0 \\ 2 \rightarrow 4 \rightarrow 0 \\ 4 \rightarrow 8 \rightarrow 12 \\ 8 \rightarrow 10 \rightarrow 12 \end{array} \right\} \Rightarrow f \circ g(x) = \{(4, 0), (2, 0), (4, 12), (8, 12)\} \quad \checkmark$$

(۲)

۴

$$\left. \begin{array}{l} \text{ب) } 4 \rightarrow 0 \\ 2 \rightarrow 0 \\ 8 \rightarrow 12 \\ 10 \rightarrow 12 \end{array} \right\} \Rightarrow Q = g \circ f(x) \quad \checkmark$$

$$\left. \begin{array}{l} \text{ج) } 4 \rightarrow 0 \rightarrow 0 \\ 2 \rightarrow 0 \\ 8 \rightarrow 12 \\ 10 \rightarrow 12 \end{array} \right\} \Rightarrow Q = f \circ g(x) \quad \checkmark$$

$$\left. \begin{array}{l} \text{د) } 4 \rightarrow 2 \rightarrow 8 \\ 2 \rightarrow 4 \rightarrow 6 \\ 4 \rightarrow 8 \rightarrow 10 \\ 8 \rightarrow 10 \rightarrow 12 \end{array} \right\} \Rightarrow g \circ g(x) = \{(4, 8), (2, 6), (4, 10), (8, 12)\} \quad \checkmark$$

$$g(4) = x \rightarrow f(x) = 2 \Rightarrow \frac{4}{2} = 2 \Rightarrow a = 4 \quad \checkmark \quad (4, 0) \quad \checkmark$$

(۲)

۵

$$f(4) = x \rightarrow (g(x)) = 1 \Rightarrow b = 0 \quad \checkmark$$

$$f(n) = a^n + b \Rightarrow f(f(n)) = a(a^n + b) + b \Rightarrow a^{n+1} + ab + b = \varepsilon n + c$$

$$\Rightarrow a = \pm 1 \quad \begin{cases} a = 1 \rightarrow n+1 \\ a = -1 \rightarrow -n-c \end{cases} \Rightarrow f(-1) = -1$$

$$n+c = -1 \Rightarrow n = -1-c \Rightarrow c - 1 - c = -1 \quad \checkmark$$

(2)

$$D_f(n) = \mathbb{R}$$

$$\{n \in D_f : f(n) \in D_g\} \xrightarrow{\sim} \mathbb{R} \setminus \{0, \varepsilon\} \quad \mathbb{R}^+ - \{1\}$$

$$D_g(n) = \mathbb{R} - \{0, \varepsilon\}$$

$$\checkmark \downarrow \mathbb{R}$$

$$\mathbb{R} - \{0, \varepsilon\} \quad (0, +\infty) - \{1\}$$

$$\sqrt{n+1} \neq 0 \rightarrow n > 0$$

$$\sqrt{n+1} \neq 1 \rightarrow n \neq 0$$

(1)

$$1 - n^2 \geq 0 \Rightarrow 1 \geq n^2 \Rightarrow n \leq 1 \quad \Rightarrow D_f = [-1, 1] \quad \checkmark$$

$$[-1, 1]$$

$$n \geq 0 \Rightarrow D_g = [0, +\infty) \quad \checkmark \quad \{n \in D_f : f(n) \in D_g\} \Rightarrow D_{f \circ g} = [0, 1] \quad \checkmark$$

$$f(n) + g(n) = D_f \cap D_g = [0, 1] \quad \checkmark \quad [-1, 1] \quad \checkmark \quad [0, 1] \quad \mathbb{R}$$

$$0 \leq f(n) \leq 1 \rightarrow 0 \leq \sqrt{1-n^2} \leq 1 \rightarrow n^2 \geq 0 \quad \checkmark$$

(1, 2, 5)

$$\text{ا) } \frac{t^{n+1}}{n-1} = t \Rightarrow t^{n-1} = t^{n+1} \Rightarrow \frac{t^{n-1} - t^{n+1} + \varepsilon}{n-1} = \varepsilon \quad \checkmark$$

$$a(t-1) = t^{n+1} \Rightarrow n = \frac{t^{n+1}}{t-1} \quad \checkmark$$

$$\text{ب) } t^c - ct$$

$$\text{ن) } f(n) = t \left(\frac{t^{n+1}}{t-1} \right) + \varepsilon$$

$$t^c = n^c + \frac{1}{n^c} + p\left(n + \frac{1}{n}\right) \Rightarrow f(t) = t^c - ct \quad \checkmark \quad f(n) = \frac{13n-11}{n-3}$$

(1, 5)

$$f(n) = \begin{cases} 1 \\ 2 \end{cases} \quad f(n) = n\sqrt{n} \Rightarrow n \begin{cases} 1 \\ 2 \end{cases} \quad \checkmark$$

$$|2-1| = 1 = \text{اختلاف} \quad \checkmark$$

(2)