

۱۹، ۵

تقریب شماره ۹

عرفان حاج علیزاده

$$\cot \frac{\pi}{4} \times \frac{2}{3} = \cot \frac{\pi}{9} = \sqrt{3}$$

(۲)

$$\sqrt{(\sqrt{3})^2 + 1} = 2 \checkmark$$

الف: $2 \cos^2 \frac{\pi}{3} = 2 \times \left(\frac{1}{2}\right)^2 = \frac{1}{2}$

$$\sqrt{\frac{2 \times 2 - 1}{4}} = \frac{\sqrt{3}}{2} \checkmark$$

(۲)

$$\therefore \frac{\sqrt{2}}{1 - \sqrt{2}} \times \frac{1 + \sqrt{2}}{1 + \sqrt{2}} = \frac{2 + \sqrt{2}}{1 - 2} = -2 - \sqrt{2}$$

$$[-2 - \sqrt{2}] = -4 \checkmark$$

$$\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

$$\frac{\sqrt{2}}{2} \sqrt{1 - \left(\frac{\sqrt{2}}{2}\right)^2} = \cancel{\frac{\sqrt{2}}{2}} \times \frac{1}{2}$$

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

دقت!

الف: $\{(4, 5) (2, 5) (9, 12) (8, 12)\} \checkmark$

(۲)

$\therefore \emptyset \checkmark \quad \mathcal{C} = \emptyset \checkmark$

د: $\{(4, 8) (2, 9) (9, 10)\} \checkmark$

$$(a, 3) (3, 2)$$

$$a = 3 \checkmark$$

$$(4, 5) (b, 1)$$

$$b = 5 \checkmark$$

(۲)

$$(a, b) = (3, 5)$$

$$ax+b$$

$$x=2x+b$$

$$a(ax+b)+b = a^2x+ab+b$$

$$a^2x+ab+b = 2x+2$$

$$a=2 \quad 2b=2$$

$$b=1$$

$$2x+2=-1 \quad 2x=-3 \quad x=-\frac{3}{2}$$

$$2x-2=(2x-2)-2 = -1 \quad \checkmark$$

$$f(x) = 2x+1 \quad 2(-1)+1=-1$$

$$x \in D_f \quad x \in \mathbb{R} \quad \checkmark$$

$$1, \sqrt{2}$$

$$f(x) \in D_g \quad D_g = \frac{1}{x(x-1)} \quad D_g = \mathbb{R} - \{0, 1\} \quad \checkmark$$

ملاحظة

$$x \neq \sqrt{x+|x|} \rightarrow x=-x$$

$$x \neq \sqrt{x+|x|} \rightarrow x=0$$

$$x \neq \sqrt{x+|x|} \rightarrow x=1 \quad \checkmark$$

$$D_{g \circ f} = (0, +\infty) - \{0\}$$

$$x \in D_f \quad x \in [-1, 1]$$

$$D_f = [-1, 1]$$

$$\frac{-1}{-1} + \frac{1}{1} = 0$$

$$x \in D_{f \circ g}$$

$$\sqrt{1-x^2} \in D_{\sqrt{x+|x|}}$$

$$[0, +\infty) \cap [-1, 1] = [0, 1]$$

$$0 \leq 1-x^2 \leq 1 \quad -1 \leq x \leq 1$$

$$D_{(f \circ g) \circ f} = [-1, 1] \quad \checkmark$$

$$\text{حل: } t = \frac{2x+1}{x-2}$$

$$t(x-2) = 2x+1$$

$$tx - 2t = 2x+1$$

$$x = \frac{2t+1}{t-2}$$

$$f(t) = 2\left(\frac{2t+1}{t-2}\right) + 2 = \frac{4t+2}{t-2} + 2 = \frac{4t+2+2t-4}{t-2} = \frac{6t-2}{t-2}$$

$$f(t) = \frac{6t-2}{t-2}$$

$$f(x) = \frac{6x-2}{x-2} \quad \checkmark$$

$$\therefore t = x + \frac{1}{x}$$

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

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

$$f(t) = t^2 - 2t \quad f(x) = x^2 - 2x \quad \checkmark$$

$$g(x) \rightarrow \begin{bmatrix} 1 \\ 0 \end{bmatrix} \begin{bmatrix} \sqrt{x} \\ 0 \end{bmatrix}$$

$$x_2 - x_1 = 2 - 1 = 1 \quad \checkmark$$

$$g \circ f(x)$$

$$1, \sqrt{x}$$

$$f(x) = 1, \sqrt{x}$$

$$x\sqrt{x} = 1$$

$$x\sqrt{x} = \sqrt{x}$$

$$x=1$$

$$x=2$$