

19, 25

نام و نام خانوادگی: اسفندیاری پاسخنامه تشریحی تکلیف شماره 9 کلاس A

$$\cot \frac{R \times \frac{r}{r}}{r} = \cot \left(\frac{R}{r} \right) = \sqrt{3} \quad \leftarrow \quad \frac{r}{r} < 1$$

$$\sqrt{(\sqrt{3})^2 + 1}, \sqrt{4} = 2 \quad \checkmark \quad \leftarrow \quad \sqrt{3} > 1 \quad (2)$$

$$f\left(\frac{1}{a}\right) \xrightarrow{a = \frac{1}{a}} f(a) = \sqrt{\frac{\frac{r}{a} - 1}{\frac{1}{a^2}}} = \sqrt{ra - a^2}$$

الف) $f \circ g\left(\frac{R}{r}\right) \rightarrow g\left(\frac{R}{r}\right) = r \cos^2 \alpha_0, \frac{1}{r} \rightarrow f\left(\frac{1}{r}\right) = \frac{\sqrt{r}}{r} \quad \checkmark$

ب) $\frac{\sqrt{r}}{1-\sqrt{r}} = -\sqrt{r} - r \rightarrow f(-\sqrt{r} - r) = [-\sqrt{r} - r], -r \quad \checkmark \quad (2)$

$$f\left(\frac{R}{r}\right) = \sin \alpha_0, \frac{\sqrt{r}}{r} \rightarrow g\left(\frac{\sqrt{r}}{r}\right) \rightsquigarrow \frac{\sqrt{r}}{r} \sqrt{1 - \frac{r}{r}} = \frac{\sqrt{r}}{r} \times \sqrt{\frac{1}{r}} = \frac{1}{r} \quad \checkmark$$

(2)

الف) $(4, 5) \quad (2, 5) \quad (9, 12) \quad (1, 12) \quad \checkmark$

ب) $\emptyset \quad \checkmark$

ج) $\emptyset \quad \checkmark$

د) $(4, 1) \quad (2, 9) \quad (9, 1) \quad \checkmark$

(2)

$$f \circ g: f(g(x)) = 2 \Rightarrow a = 4$$

$$g \circ f: g(f(x)) = 1 \Rightarrow b = a \quad (a, b) = (4, 5) \quad \checkmark$$

(2)

$$f(u) = au + b \Rightarrow f(f(u)) : a^2u + ab + b = fu + v$$

$$\begin{cases} a=2 \rightarrow b=1 \\ a=-2 \rightarrow b=-3 \end{cases}$$

$$f(u) : fu + v$$

$$g(f(-1))$$

$$g(-1) = -1$$

$$u \in Df, f(u) \in Dg$$

$$\{u \in \mathbb{R}, \sqrt{u+1} \neq \{0, 1\}\}$$

$$u > 0 - \{1\} \rightarrow u \neq 1$$

$$D : u \in (0, +\infty) - \{1\}$$

$$D_{g \circ f} = (0, +\infty) - \{1\}$$

$$u \in Df, f(u) \in D_{f+g}$$

$$\{-1 < u < 1, 0 \leq \sqrt{1-u^2} \leq 1\} \Rightarrow D_{(f+g) \circ f} : u \in [-1, 1]$$

$$\frac{13u+1}{u-2} = t \Rightarrow u = \frac{t+1}{t-13} \Rightarrow f(u) = 1 \left(\frac{t+1}{t-13} \right) + 1 = \frac{13u-11}{u-13}$$

$$u + \frac{1}{u} = t \quad \left(u + \frac{1}{u}\right)^2 = u^2 + 2 + \frac{1}{u^2} \Rightarrow u^2 + \frac{1}{u^2} = \left(u + \frac{1}{u}\right)^2 - 2$$

$$u + \frac{1}{u} = u \rightarrow f(u) = u^2 + 13u$$

$$g(f(u)) = 0, \quad g(\sqrt{f}), \quad g(1) = 0$$

$$\Rightarrow f(u) \rightarrow \sqrt{f} \Rightarrow u = 1 \Rightarrow u = 1$$