نام و نام خانوادگی .... **پاسخنامه تشریحی تکلیف شماره** ...۸... **کلاس** .... دوازدهم ریاضی A

۱۸,۷۵

۱

$f(x) = \sqrt{\log_{2}^{x-1}}$ $\qquad g(x) = \sqrt{-x^2+4x-4}$

$D_{gof(x)} = ?$

$gof \rightarrow f(x) = t \rightarrow \sqrt{-t^2+4t-4} = \sqrt{-(t-2)^2}$

فقط اگر ۰ شه ok است!

$t-2=0 \rightarrow t=2$

$t=2 \rightarrow f(x)=2 \rightarrow \sqrt{\log_{2}^{x-1}} = 2 \rightarrow \log_{2}^{x-1} = 4$

$x-1=16$

$x=17$

$D_{gof} = \{17\}$ ✓ ②

۲

$f(x) = 2x-5 \qquad g(x) = x^2-3x+8 \qquad fog(x) = gof(x)$

$\alpha^2+\beta^2 = ?$

$fog(x) = 2(x^2-3x+8)-5 \rightarrow 2x^2-6x+11$

$gof(x) = (2x-5)^2 - 3(2x-5)+8 = 4x^2-26x+48$

$4x^2-26x+48 = 2x^2-6x+11 \rightarrow 2x^2-20x+37=0$

$\alpha^2+\beta^2 = S^2-2P \rightarrow S = \frac{20}{2} = 10 \rightarrow S^2-2P = 100-37 = 63$ ✓ $/ P = \frac{37}{2}$

②

۳

$gof(x) = 5x^2+11 \qquad f(x) = 2x \qquad \min g(x-7) = ?$

$f(x) = 2x \longrightarrow 2x = t \longrightarrow x = \frac{t}{2} \longrightarrow 5\left(\frac{t}{2}\right)^2+11 = g(t)$

$g(x) = \frac{5x^2}{4}+11 \longrightarrow g(x-7) = \frac{5(x-7)^2}{4}+11$ ②

$g(x-7) = \frac{5x^2}{4} - \frac{70x}{4} + \frac{245}{4} + 11$

(ضریب x^2) $a>0 \rightarrow$ نمودار min دارد $\rightarrow$ $\min \begin{cases} \frac{-b}{2a} = 7 \\ y_s = 11 \end{cases}$ ✓

۴

$f(x) = 3x-4 \qquad fog(x) = 3x^2-6x-1 \qquad gof(x) = ?$

$fog(x) = 3g-4 = 3x^2-6x-1 \longrightarrow 3g = 3x^2-6x+3 \qquad g(x) = x^2-2x+1$

$gof(x) = (3x-4)^2 - 2(3x-4)+1 \longrightarrow 9x^2-30x+25$ ✓

②

۵

$2g(x) = 3f(x)-14 \qquad g(x) = \frac{3}{2}f(x)-7 \longrightarrow$

هر دو تابع خطی اند

$f-g(x) = -x+5 \rightarrow f(x) - \frac{3}{2}f(x)+7 \rightarrow \frac{-1}{2}f(x)+7 = f(x)-g(x)$

$\rightarrow \frac{-1}{2}f(x)+7 = -x+5 \rightarrow f(x) = 2x+4 \longrightarrow fog(x) = 2(3x-1)+4 = 6x+2$

$g(x) = \frac{3}{2}(2x+4)-7 \rightarrow g(x) = 3x-1$

② $fog(x) = 0 \rightarrow 6x+2=0$

$x = \frac{-1}{3}$ ✓

۶

$f(x)=9^x \qquad g(x)=\log_3^x \qquad fog(x)\leq gof(x)$

$fog(x)=9^{\log_3^x}=x^{\log_3^9}=x^2$

$gof(x)=\log_3^{9^x}=\log_3^{3^{2x}}\rightarrow 2x$

$x^2\leq 2x \longrightarrow x^2-2x\leq 0$

$x(x-2)\leq 0$

ریشه‌ها ۰ , ۲

$\begin{array}{ccccc} & 0 & & 2 & \\ + & | & - & | & + \end{array}$

$\boxed{x>0 \text{ شرط}}$ ✓

$x\in(0,2]$ ✓

۲ عدد صحیح

②

۷

$f\left(\frac{x^2-2}{x}\right)=x^2+x-4-\frac{2}{x}+\frac{4}{x^2} \qquad f(x)=?$

$f\left(x-\frac{2}{x}\right)=\underbrace{x^2+\frac{4}{x^2}-4}_{\left(x-\frac{2}{x}\right)^2}+x-\frac{2}{x}\rightarrow \underbrace{f(t)=t^2+t}$

$\longrightarrow f(x)=x^2+x$ ✓

②

۸

$f(x)=\log_2^x \qquad g(x)=8x-x^2 \qquad -x^2+8x>0$

$R_{fog}=(-\infty,4]$

$\underbrace{x(-x+8)>0}\longrightarrow \begin{array}{ccc} & 0 \quad 8 & \\ - & + & - \end{array}$

$fog(x)=\log_2^{-x^2+8x}\longrightarrow D_{fog(x)}\Rightarrow x\in D_g\ ,\ g(x)\in D_f$

$D_g\rightarrow\mathbb{R}$

①

$A\cap B=[0,4]$ → ۴ عدد صحیح

$\boxed{\text{۷ عدد صحیح}}$

$D_{fog(x)}\overset{A}{\Rightarrow}(0,8)$ ✓ $\qquad R_{fog(x)}\overset{B}{=}\mathbb{R} \qquad A\cap B=(0,8)$

۹

$fof(x)=1-3f^2(x) \qquad g(x)=x-1 \qquad h(x)=x^3+2x+1$

$\underbrace{h(g(x))}=f(x)$

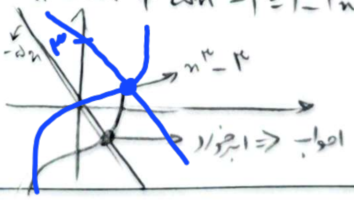
۱/۷۵

$f(f(x))=1-3f^2(x)\longrightarrow f(x)=1-3x^2$

$(x-1)^3+2(x-1)+1=x^3-3x^2+5x-2$

$x^3-3x^2+5x-2=1-3x^2\rightarrow x^3+5x-3=0$

$x^3-3=-5x$ ✓



۱۰

$f(x)=x-\frac{4}{x} \qquad gof(x)=ax^3+2x \qquad g(3)=8 \qquad a=?$

$g\left(x-\frac{4}{x}\right)=ax^3+2x \qquad x-\frac{4}{x}=3\longrightarrow x^2-3x-4=0$

②

$(x-4)(x+1)=0$

ریشه‌ها: ۴ , −۱

$x=-1\longrightarrow -a-2=8\rightarrow a=-10$ ✓

$x=4\rightarrow 64a+8=8\rightarrow a=0$ غ‌ق‌ق ⇐ شرط: $a\neq 0$

ق‌ق (غیرقابل قبول)