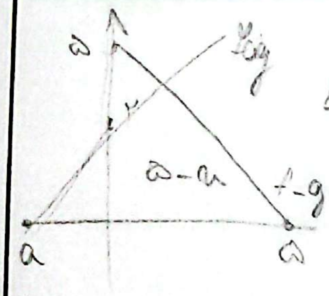
نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ...۸... کلاس ...دوازدهم ریاضی B...

$g\circ f(x)$ $f(x)=\sqrt{\log_2^{(x-1)}}$ $g(x)=\sqrt{-x^2+4x-4}$ $g\circ f(x)=\sqrt{-(f(x)-2)^2} \Rightarrow \sqrt{-(\sqrt{\log_2^{(x-1)}}-2)^2}$ $\Rightarrow \sqrt{\log_2^{x-1}}-2=0 \Rightarrow \log_2^{x-1}=4 \Rightarrow x-1=16$ $\Rightarrow x=17 \Rightarrow D_f=\{17\}$	1
$f(x)=2x-5$ $g(x)=x^2-3x+8$ $\quad f\circ g=g\circ f \Rightarrow 2(x^2-3x+8)-5=(2x-5)^2-3(2x-5)+8$ $\Rightarrow 2x^2-6x+16-5=4x^2-20x+25-6x+15+8 \Rightarrow 2x^2-6x+11=4x^2-26x+48$ $\Rightarrow 2x^2-20x+37 \Rightarrow \alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta \Rightarrow S^2-2P \Rightarrow 100-37=63$ $S=10 \quad P=\frac{37}{2}$	2
$g\circ f=5x^2+11 \Rightarrow g(x)=\frac{5}{4}x^2+11 \Rightarrow g(x-7) \Rightarrow \frac{5}{4}(x-7)^2+11$ $f(x)=2x$ $\Rightarrow \frac{5}{16}(x^2-14x+49)+\frac{44}{4} \Rightarrow \boxed{\min \Rightarrow 11}$	3
$f(x)=3x-4$ $\quad 3g-4=3x^2-6x-1 \Rightarrow 3g=3x^2-6x+3$ $f\circ g=3x^2-6x-1$ $\quad \Rightarrow 3(x-1)^2-4$ $\Rightarrow g(x)=x^2-2x+1 \Rightarrow g(x)=(x-1)^2$ $\Rightarrow g\circ f \Rightarrow (f-1)^2 \Rightarrow (3x-4-1)^2 \Rightarrow (3x-5)^2=9x^2-30x+25$	4
 $2g(x)=3f(x)-14 \Rightarrow f-g(x) \Rightarrow -\frac{1}{2}f(x)+7=5-x$ $\Rightarrow g(x)=\frac{3}{2}f(x)-7$ $\quad \Rightarrow f(x)=2x+4 \Rightarrow g(x)=3x-1$ $\Rightarrow f\circ g \Rightarrow 2(3x-1)+4 \Rightarrow 6x-2+4 \Rightarrow 6x+2$ $\Rightarrow a=-\frac{1}{3}$	5

$f(x) = 9^x = 3^{2x}$

$g(x) = \log_3 x \Rightarrow fog \le gof \Rightarrow 3^{2\log_3 x} \le \log_3 3^{2x} \Rightarrow x^2 \le 2x$

$\Rightarrow x^2 - 2x \le 0 \Rightarrow x(x-2) \le 0 \Rightarrow 0 \le x \le 2 \Rightarrow x \neq 0$

$\Rightarrow D_x = (0, 2] \Rightarrow \{1, 2\}$ ۶

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

$\Rightarrow f\left(x - \frac{2}{x}\right) = \left(x - \frac{2}{x}\right)^2 + \left(x - \frac{2}{x}\right) \Rightarrow f(x) = x^2 + x$ ۷

$f(x) = \log_2 x \quad g(x) = 8x - x^2$

$fog \Rightarrow \log_2 (8x - x^2) \quad 8x - x^2 \Rightarrow x(8-x) > 0 \Rightarrow 0 < x < 8$

$\Rightarrow D_f = (0, 8) = A$ ۸

$R_f \Rightarrow \min x \Rightarrow \max = -\frac{b}{2a} \Rightarrow x = 4 \Rightarrow \log_2 16 = 4 \Rightarrow R_f = (-\infty, 4] = B$

$A \cap B \Rightarrow (0, 4] \Rightarrow \{1, 2, 3, 4\}$

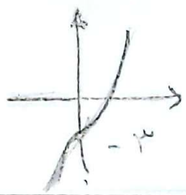
$hog(x) = 1 - 3f(x) \Rightarrow f(x) = 1 - 3x^2 \Rightarrow h(g(x)) = f(x)$

$g(x) = x - 1 \ , \ h(x) = x^3 + 2x + 1$

$\Rightarrow (x-1)^3 + 2(x-1) + 1 = 1 - 3x^2 \Rightarrow x^3 - \cancel{3x^2} + 3x - \cancel{1} + 2x - 2 + \cancel{1} = \cancel{1} - \cancel{3x^2}$ ۹

$x^3 + 5x - 3 = 0 \Rightarrow$ طبق شکل تابع تقاطع دو نمودار یک ریشه است

و ۳ ریشه هم ندارد بین ۰ و ۱ ریشه دارد (مگر اینکه مشتق هم در نقطه‌ای صفر بدانیم)



$f(x) = x - \frac{4}{x}$

$gof(x) = ax^3 + 2x$

$g(3) = 8$

$g(f(x)) = 8 \Rightarrow f(x) = 3 \Rightarrow x - \frac{4}{x} = 3 \Rightarrow x = \begin{cases} 4 \\ -1 \end{cases}$

$\Rightarrow \begin{cases} x = 4 \Rightarrow 64a + 8 = 8 \Rightarrow a = 0 \ \checkmark \\ x = -1 \Rightarrow -a - 2 = 8 \Rightarrow a = -10 \ \checkmark \end{cases}$ ۱۰

جواب