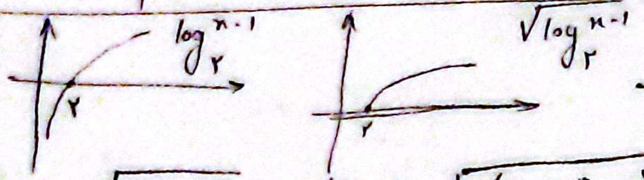
18,75

نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱ (1,5)



$\Rightarrow D_f = [2, +\infty)$

$\sqrt{\log_2^{x-1}} = 2$

هست

$\log_2^{x-1} < 4$

$x < 17$

$g(x) = \sqrt{-(x-2)^2} \Rightarrow g(f(x)) = \sqrt{-(\log_2^{x-1} - 2)^2} \Rightarrow -(\log_2^{x-1} - 2)^2 \geq 0$

$\Rightarrow \log_2^{x-1} - 2 = 0 \Rightarrow \log_2^{x-1} = 2 \Rightarrow x - 1 = 4 \Rightarrow x = 5$ $\quad D_{gof} = \{5\}$

۲ (2)

$fog(x) = gof(x) \Rightarrow 2x^2 - 6x + 16 - 5 = (2x-5)^2 - 3(2x-5) + 8$

$\Rightarrow 2x^2 - 20x + 37 = 0 \Rightarrow \alpha^2 + \beta^2 = S^2 - 2P = 100 - 37 = 63$

۳ (2)

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

$\Rightarrow \frac{5}{4}x^2 + \frac{5 \times (-14)}{4}x + c \Rightarrow \frac{-b}{2a} = x_s = \frac{\frac{14 \times 5}{4}}{\frac{10}{4}} = 7$

$\Rightarrow g(7-7) = g(0) = 5(0)^2 + 11 = 11$

۴ (2)

$f(g(x)) = 3(g(x)) - 4 = 3x^2 - 6x - 1 \Rightarrow 3x^2 - 6x + 3 = 3(g(x))$

$\Rightarrow g(x) = x^2 - 2x + 1 = (x-1)^2$

$\Rightarrow gof(x) = (3x-5)^2 = 9x^2 + 25 - 30x$

۵ (1,75)

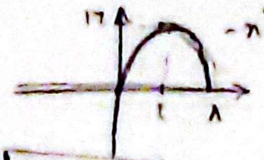
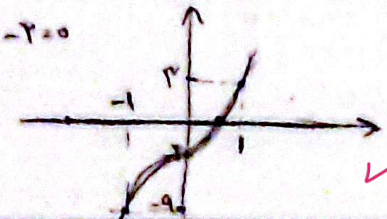
$(f-g)(x) = -x + 5 \quad fog(x) = \frac{2}{a}x + 2 \quad , \quad 3f(x) - 2g(x) = 14$

$\Rightarrow f(x) + 2(-x+5) = 14 \Rightarrow f(x) = 2x + 4 \Rightarrow \begin{cases} (f-g)(x) = -x + 5 \\ f(x) = 2x + 4 \end{cases}$

$\Rightarrow g(x) = 3x - 1 \Rightarrow fog(x) = 2(3x-1) + 4 = 6x + 2$

$\Rightarrow -\frac{2}{a}x + 2 = 6x + 2 \Rightarrow a = -\frac{1}{3}$

$-\frac{2}{a}x + 2 = 6x + 2 \rightarrow a = -\frac{1}{3}$

$f(x)=3^{2x} \quad g(x)=\log_3^x \Rightarrow \begin{cases} fog(x)=3^{2\log_3^x}=x^2 \\ gof(x)=\log_3^{3^{2x}}=2x \end{cases}$ ۱/۵ $\Rightarrow x^2 \leq 2x \Rightarrow x^2-2x \leq 0 \Rightarrow \underset{+\ \ \ -\ \ \ +}{\overset{0\ \ \ \ 2}{\longrightarrow}} \Rightarrow x \in (-\infty,0] \cup [2,+\infty)$ دقت کن! $0 \leq x \leq 2$	۶
$(x-\frac{2}{x})^2 = x^2+\frac{4}{x^2}-4 \Rightarrow f(x-\frac{2}{x}) = (x-\frac{2}{x})^2+(x-\frac{2}{x})$ $\Rightarrow \boxed{f(x)=x^2+x}$ ✓ ۲	۷
$D_{fog}(x)=A \Rightarrow fog=\log_2^{-x^2+8x} \Rightarrow -x^2+8x>0 \quad \underset{-\ \ \ +\ \ \ -}{\overset{0\ \ \ \ 8}{\longrightarrow}}$ $x \in (0,8)=A$ $R_{fog}=B \Rightarrow$  $-x^2+8x \quad \max=16 \Rightarrow \log_2^{16}=4$ $\min=0 \Rightarrow \log_2^0=-\infty \Rightarrow (0,4]=B$ $A \cap B=(0,4] \Rightarrow \boxed{\{1,2,3,4\}}$ ✓ ۴ عضو صحیح دارد ۲	۸
$f(f(x))=1-3f^2(x) \Rightarrow f(x)=1-3x^2$ $h(g(x))=(x-1)^3+2(x-1)+1=x^3-1\cancel{-3x^2+3x}+2x-2\cancel{+1}=\cancel{1-3x^2}$ $\Rightarrow x^3+5x-2=0$  ۱ جواب دارد ✓ ۲	۹
$f(x)=3 \Rightarrow \frac{x^2-4}{x}=3 \Rightarrow x^2-3x-4=0 \Rightarrow (x-4)(x+1) \Rightarrow \begin{cases} x=-1 \\ x=4 \end{cases}$ ارفاق $g(3)=gof(4)=gof(-1)=8=ax^3+2x$ $gof(-1)=-a-2=8 \Rightarrow -a=10 \Rightarrow a=-10$ ✓ ۲ $gof(4)=64a+8=8 \Rightarrow 64a=0 \Rightarrow a=0$ ~~غلط~~ → ~~[illegible]~~ مریزی! $a=0$ قابل قبول	۱۰

$gof(x)=2x \longrightarrow g(3)=8 \longrightarrow g(f(x))=8$ $\quad f(x)=3$
$\downarrow$
$x=-1$ ✗ یا ۴ ✓