۱۸,۵

نمره [illegible]

1- $\log_2 x-1 > 0 \quad x>1 \quad f(x)=\sqrt{\log_2^{x-1}} \to \geq 0 \quad x-1 \geq 1 \Rightarrow x \geq 2$ ✓ ۱,۵

$g(x)=\sqrt{-(x-2)^2} \Rightarrow \underbrace{\sqrt{-(\log_2^{x-1}-2)^2}}_{g\circ f(x)}$

$D_{g\circ f}=\{17\}$

$\Rightarrow \log_2 \frac{x-1}{4}=0 \Rightarrow \frac{x-1}{4}=1$

$\Rightarrow x-1=4 \Rightarrow x=5 \quad D_{g\circ f}=\{5\}$

$\log_2^{x-1}=4 \to x-1=16 \to x=17$

2- $g(x)=\left(x-\frac{3}{2}\right)^2+\frac{23}{4} \qquad f\circ g(x)=2\left(x-\frac{3}{2}\right)^2+\frac{46}{4}-5$

$\to x^2+\frac{9}{4}-3x \qquad 2x^2-6x+16-5=2x^2-6x+11$

$g\circ f(x)=\left(2x-5-\frac{3}{2}\right)^2+\frac{23}{4}=\left(2x-\frac{13}{2}\right)^2+\frac{23}{4}$

$4x^2+\frac{169}{4}+\frac{23}{4}-26x$

$\Rightarrow 2x^2-6x+11=4x^2+48-26x \Rightarrow 2x^2-20x+37=0 \quad \frac{c}{a}=\frac{37}{2}$

$-b\pm\sqrt{}$

$\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta \Rightarrow 100-37=63$ ✓ ۲

$\to -\frac{b}{a}=10$

3- $f(x)=2x \quad g\circ f=5x^2+11 \to g(x)=\frac{5}{4}(x)^2+11 \Rightarrow \frac{5}{4}(2x)^2+11=5x^2+11$

$a(2x)^2+b=5x^2+11 \qquad -\frac{b}{2a}=0$

$f(x-7)=\frac{5}{4}x^2+11+7=\frac{5}{4}x^2+18 \to x=-\frac{b}{2a}=0 \qquad \Rightarrow 11$ ۱,۵

$\cancel{y=18} \to y_{min}=11$

4- $f(x)=3x-4 \qquad \Rightarrow \underbrace{3(x^2-2x+1)}_{3x^2-6x+3}-4=3x^2-6x-1$

$f\circ g(x)=3x^2-6x-1 \qquad \Rightarrow y=1$ ۲

$\Rightarrow g(x)= \cancel{[illegible]} \quad x^2-2x+1=(x-1)^2 \qquad g\circ f(x)=(3x-4-1)^2=(3x-5)^2$

$=9x^2+25-30x$ ✓

$f - g = -x + 5$ $\quad$ ~~$fog(x) =$~~

۵-

$2f(x) - 2g(x) - 14 = -f(x)$

$\Rightarrow 2(-x+5) - 14 = -2x + 10 - 14 = -f(x) \Rightarrow f(x) = 2x + 4$

$\Rightarrow 2g(x) = 6x + 12 - 14 = 6x - 2 \Rightarrow g(x) = 3x - 1$

$\Rightarrow fog(x) = 2(3x - 1) + 4 = 6x + 2 \Rightarrow 6x + 2 = 0 \Rightarrow a = -2/6 = -1/3$

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۶-

$g(x) = \log_3 x \longrightarrow x > 0$

$fog(x) = 9^{\log_3 x} = x^{\log_3 9} = x^2$ $\qquad x^2 \leq 2x \Rightarrow x^2 - 2x \leq 0$

$gof(x) = \log_3 9^x = \log_3 (3)^{2x} = 2x$ $\qquad x(x-2) \leq 0 \Rightarrow x = [0, 2]$

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$\Rightarrow \{1, 2\} \longrightarrow$

۷-

$f\left(x^2 - 2/x\right) = x^2 + x - 4 - 2/x + 4/x^2$

به توان ۲

$\left(x - 2/x\right)^2 = x^2 + 4/x^2 - 4 \longrightarrow x^2 + x - 4 - 2/x + 4/x^2$

$x - 2/x \Rightarrow +x$

$\Rightarrow f(x) = x^2 \cancel{-4} + x$

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۸-

$f(x) = \log_2 x \longrightarrow x > 0$ $\qquad fog(x) = \log_2 (8x - x^2)$ $\qquad 8x - x^2 > 0$

$x(8 - x) > 0 \Rightarrow x = (0, 8)$

$\Rightarrow D_{fog}(x) = (0, 8)$ $\qquad A \cap B \Rightarrow [4, 8)$ $\longrightarrow (0, 4]$

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

۴ غلط تصحیح

$-\infty \leftarrow$

$x = 7 \quad \log_2 7$

$-1/2 = 4$

$32 - 16 = 16$

۱/۵

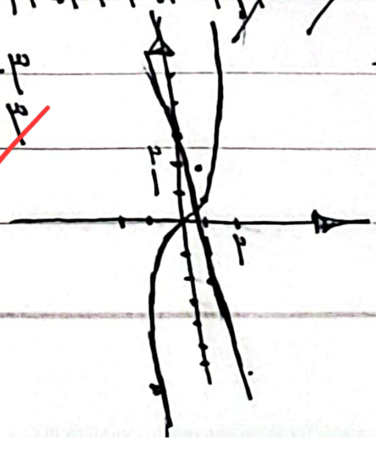
۹-

$f \circ f(x) = 1 - 2f^2(x) \Rightarrow f(x) = 1 - 2x^2$

$(x-1)^3 + 6x - 6 + 1 \Rightarrow x^3 - 1 \cancel{- 3x^2} + 3x + 6x - 6 + \cancel{1} = \cancel{1} - \cancel{2x^2}$

$\Rightarrow x^3 + 5x - 3 = 0$ $\qquad -x^3 = +5x - 3$

$x^3 = -5x + 3$ $\qquad \longrightarrow$ رسم



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۹-

$f(x) = x - ۴/x = ۳$ $\quad x^۲ - ۳x - ۴ = ۰$ $\quad (x-۴)(x+۱) = ۰$ $\quad x = ۴$

$x = -۱$

$g \circ f(x) = ۹۴a + ۸ = ۸ \Rightarrow a = ۰$

$-a \pm ۲ = ۸ \Rightarrow +a = -۱۰$ ✓

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