نام و نام خانوادگی ...[illegible]...... پاسخنامه تشریحی تکلیف شماره ۲۸... کلاس ...دهم ریاضی.........

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$f(x) = \begin{cases} x^2+2x & x \geq a \\ ax-4 & x \leq a \end{cases}$ تابع است $\xrightarrow{x=a}$ $a^2+2a = a^2-4 \Rightarrow 2a+4=0$

$\Rightarrow a=-2$

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$g(x) = 2x+b$ تابع $\xrightarrow{(2,3)}$ $3 = 4+b \Rightarrow b = -1$

$f(x) = \frac{x^2+a}{2x-b}$ $\xrightarrow[b=-1]{(2,3)}$ $3 = \frac{4+a}{4+1} \Rightarrow 4+a = 15 \Rightarrow a = 11$

$f(1) = \frac{1+11}{2+1} = 4$

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$f(x) = \frac{4x+1}{2x^2+ax+b}$ $D_f = \mathbb{R} - \{-1, 4\} \Rightarrow 2-a+b=0 \Rightarrow a-b=2 \Rightarrow a=b+2$

$32+4a+b=0 \xrightarrow{a=b+2} 32+8+5b=0$

$\Rightarrow 40=-5b \Rightarrow b=-8$

$\Rightarrow a=-6$

$f(1) = \frac{4+1}{2-6-8} = -\frac{5}{12}$

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$f(x) = \frac{x^3-\sqrt{x}}{-4x^2+ax+b}$ $D_f = \mathbb{R} - \{-1\} \Rightarrow$ ~~$4-a+b=0 \Rightarrow a-b=4$~~

$-4x^2+ax+b = -4(x+1)^2$

$= -4x^2 \underbrace{-8x}_{a} \underbrace{-4}_{b}$

$a+b = -8-4 = -12$

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~~$x^2 \neq 0 \Rightarrow x \neq 0$~~

~~$4-\frac{1}{x^2} \geq 0 \Rightarrow x \geq \frac{1}{2}$ یا $x \leq -\frac{1}{2}$~~

~~$\Rightarrow D_f = \mathbb{R} - (-\frac{1}{2}, \frac{1}{2})$~~

$f(x) = \frac{2x}{(x-1)(x^2+mx+1)}$ $D_f = \mathbb{R} - \{1\}$

دو حالت:

همواره $x^2+mx+1 \neq 0$
$\Rightarrow \Delta < 0 \Rightarrow m^2-4<0$
$\Rightarrow m \in (-2, 2)$ (1)

یا $x^2+mx+1 \xrightarrow{x=1} 1+m+1=0$
$\Rightarrow m=-2$ (2)

(1) $\cup$ (2) $\Rightarrow -2 \leq m < 2$

$f(x) = \sqrt{4 - \frac{1}{x^2}}$ $\quad x^2 \neq 0 \rightarrow x \neq 0$

$4 - \frac{1}{x^2} \geq 0 \Rightarrow x \geq \frac{1}{2}$ یا $x \leq -\frac{1}{4}$

$\Rightarrow D_f = \mathbb{R} - \left(-\frac{1}{2}, \frac{1}{2}\right)$ ۶

$f(x) = \sqrt{mx^2 + 2mx + 1}$ $\quad mx^2 + 2mx + 1 \geq 0 \rightarrow m > 0$

$\Delta \leq 0$

$\Rightarrow 4m^2 - 4m \leq 0 \Rightarrow 4m(m-1) \leq 0$ $\quad \begin{array}{ccc} 0 & & 1 \\ + & - & + \end{array} \Rightarrow 0 \leq m \leq 1$ ۷

$m \in [0, 1]$

$f(x) = \begin{cases} \frac{4x^2 - 1}{2x - 1} & x \neq a \\ 4x + k & x = \frac{1}{2} \end{cases}$ $\quad g(x) = 2x + 1$

$\xrightarrow{x = \frac{1}{2}} g(x) = 2 = f(x) = 4 \times \frac{1}{2} + k \Rightarrow k = 0$ ۸

$\xrightarrow{x = a} 2a - 1 = 0 \Rightarrow a = \frac{1}{2}$ $\quad \boxed{a + k = \frac{1}{2}}$

$f(x) = \begin{cases} \frac{9x^2 - 4}{3x + 2} & x \neq -\frac{2}{3} \\ 2ax + 2 & x = -\frac{2}{3} \end{cases}$ $\quad g(x) = 3x + b$

$\xrightarrow{x = 0} \frac{9 \times 0 - 4}{3 \times 0 + 2} = 3 \times 0 + b \Rightarrow \frac{-4}{2} = b \Rightarrow b = -2$ $\quad \boxed{a - b = 3 - (-2) = 5}$

$\xrightarrow{x = -\frac{2}{3}} 3 \times \left(-\frac{2}{3}\right) - 2 = 3 \times \left(-\frac{2}{3}\right) \times a + 2 \Rightarrow -4 = -2a + 2 \Rightarrow -2a = -6$

$a = 3$

$f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & x \neq 2 \\ 2a^2 + ax & x = 2 \end{cases}$ $\quad g(x) = x + 2$

$x = 2 \longrightarrow 2 + 2 = 2a^2 + 2a \Rightarrow 2a^2 + 2a - 4 = 0 \Rightarrow 2(a^2 + a - 2) = 0$ ۱۰

$\Rightarrow 2(a + 2)(a - 1) = 0 \Rightarrow \begin{cases} a = +1 \\ a = -2 \end{cases}$