بنام خدا

Date :   Subject : الیا رمضانی دهم B

(۱)

$$f(x)\begin{cases} x^2+2x & ; x \geq a \\ ax-4 & ; x \leq a \end{cases} \rightarrow f(a) = a^2+2a = a^2-4$$

$$\rightarrow \boxed{a=-2}$$

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(۲)

$$(2,3): g(2) = 4+b = 3 \rightarrow b=-1 \rightarrow g(x) = \boxed{2x-1}$$

$$\rightarrow f(x) = \frac{x^2+a}{2x+1}$$

$$g(2) = f(2) \rightarrow 3 = \frac{4+a}{\underset{5}{2(2)+1}} \rightarrow a = 11 \rightarrow f(x) = \frac{x^2+11}{2x+1}$$

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

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(۳)

دامنه تابع = $R - \{$ریشه مخرج$\}$

$$\text{if } x=-1, 4 \rightarrow 2x^2+ax+b=0$$

$$x=-1 \rightarrow 2-a+b=0$$

$$x=4 \rightarrow 32+4a+b=0 \quad \begin{cases} a=-6 \\ b=-8 \end{cases}$$

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

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(۴)

ریشه مخرج $= -1$

$$(x+1)^2 = x^2+2x+1 \xrightarrow{\times(-4)} -4x^2-8x-4$$

$$\rightarrow a=-8 , b=-4$$

$$a+b = -12$$

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(۵)

دامنه = $R-$ریشه مخرج $\Leftarrow \mathbb{R}-\{1\}$ ضابطه درجه ۲ مخرج ریشه ندارد

یا ریشه مضاعف ۱ دارد

Date : Subject :

$I\quad x^2+mx+1\neq 0 \longrightarrow \Delta<0 \rightarrow m^2-4<0 \rightarrow -2<m<2$

$II\quad x^2+mx+1 \xrightarrow{if\ x=1} 1+m+1=0 \rightarrow m=-2$

$I\cup II=[-2,2)$

$f(x)=\sqrt{4-\frac{1}{x^2}}$ (۶)

$I\rightarrow x^2\neq 0 \longrightarrow x\neq 0$

$II\rightarrow 4-\frac{1}{x^2}\geqslant 0 \rightarrow \frac{1}{x^2}\leqslant 4 \xrightarrow{x^2>0} 4x^2\geqslant 1$

$\longrightarrow x^2\geqslant \frac{1}{4} \longrightarrow x\geqslant \frac{1}{2}\ ,\ x\leqslant -\frac{1}{2}$

$I\cup II = (-\infty,-\frac{1}{2}]\cup[\frac{1}{2},+\infty)$

$mx^2+2mx+1\geqslant 0 \longrightarrow I \rightarrow$ دهانه رو به بالا $\rightarrow m>0$ (۷)

$II\rightarrow$ عرض رأس $\geqslant 0 \longrightarrow \frac{-\Delta}{4a}\geqslant 0 \rightarrow \frac{-(4m^2-4m)}{4m}\geqslant 0$

$\longrightarrow \frac{4m(1-m)}{4m}\geqslant 0 \longrightarrow m\leqslant 1$ $\quad I\cap II \rightarrow 0\leqslant m\leqslant 1$

$f(x)=g(x)\longrightarrow f(\frac{1}{2})=g(\frac{1}{2}) \rightarrow 2+K=1+1$ (۸)

$\rightarrow K=0$

$\frac{4x^2-1}{2x-1} \longrightarrow x\neq$ ریشه مخرج $\neq a\neq \frac{1}{2} \longrightarrow a=\frac{1}{2}$ $\Big\}\ a+K=\frac{1}{2}$

$g(x)=f(x)\longrightarrow g(0)=f(0)\rightarrow b=\frac{-4}{2}=-2$ (۹)

$\rightarrow g(x)=3x-2$

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

$a-b=5$ $\qquad \rightarrow a=3$

PARAMOUNT

Date : Subject :

$D_{(f)} = D_{(g)}$ ✓ (10)

$\mathbb{R}$ $\mathbb{R}$

$x+2 = \frac{x^2-4}{x-2}$ ✓ if $x=2 \rightarrow x+2 = 2\alpha^2+\alpha x$

$\rightarrow 4 = 2\alpha^2+2\alpha$

$\rightarrow 2 = \alpha^2+\alpha$

$\rightarrow \alpha^2+\alpha-2=0$

$\rightarrow (\alpha+2)(\alpha-1)=0$

$\alpha=-2$, 1

$1, -2$