Subject : ( ) Date : .....

بنیامین نوروزی - تکلیف ۲۴ - یازدهم پسر B

(۱) $f(x)=3^{2x-1}$

$M\left|\begin{matrix}1\\1\end{matrix}\right. \quad N\left|\begin{matrix}3\\9\end{matrix}\right. \rightarrow 1=3^{A+B} \;/\; 9=3^{3A+B}$

$\left.\begin{matrix}2A=2\rightarrow \boxed{A=1}\\ \boxed{B=-1}\end{matrix}\right\}$

$\boxed{-A=B} \leftarrow A+B=0 \qquad 3A+B=2$

$\Rightarrow f(0)=3^{-1}=\frac{1}{3}$

(۲)

$3^{x+3}=3^x\times 3^3=3^{2x}+18 \Rightarrow (3^x)^2-8(3^x)+15=0 \rightarrow (t-3)(t-5)=0$

$t=3^x$; $t=3$ ⑤ ; $t=5$ ③

$3^{x_1}=3 \rightarrow \boxed{\log_3^3=x_1}$, $3^{x_2}=5 \rightarrow \boxed{\log_3^5=x_2} \Rightarrow x_1+x_2=\log_3^{15}$

(۳)

$\log_{21}^{(7\times 21)}\times \log_{21}^{(3\times 21\times 21)}=1+\log_{21}^{21}\times 2+\log_{21}^3=(2+\log_{21}^3)(2-\log_{21}^3)$

$=4-(\log_{21}^3)^2 \rightarrow (\log_{21}^3)^2+4-(\log_{21}^3)^2=4$

(۴)

$\log_{10}^{(1-x)^2(1-x)^3}=5 \rightarrow 10^5=(1-x)^5 \rightarrow 1-x=10 \rightarrow \boxed{x=-9}$

$\log_3^9=2$

(۵)

$\log_2^{(x-2)(x^2+2x+4)}=3 \xrightarrow{\text{فیل و فنجون}} x^3-2^3=2^3 \rightarrow x^3=16 \rightarrow x=2^{\frac{4}{3}} \rightarrow \log_{2^{\frac{1}{3}}}^{2^{\frac{4}{3}}}$

$\rightarrow 4\log_2^2=4$

(۶)

$\log(2-x)-\log(2-x)^{-2}=3\log(2-x)=3 \rightarrow 10^1=2-x \Rightarrow \boxed{x=-8}$

$\rightarrow \log_{2^{\frac{1}{2}}}^{2^3}=6$

(۷) $3^{x^2-2}=3^{4x} \Rightarrow x^2-2=4x \rightarrow x^2-4x-2=0 \rightarrow \frac{4\pm\sqrt{16+8}}{2}=2\pm\sqrt{6}$

$\boxed{x>2} \rightarrow 2+\sqrt{6}$ ✓ , $2-\sqrt{6}$ غ ق ق $\Rightarrow \log_6^{\frac{1}{2}}=\frac{1}{2}$

Arman

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(۸)

$$\log_{۳۲\times۲}^{۲۳} = \frac{۱}{\log_{۲}^{۳۲\times۲}} = \frac{۱}{\frac{۱}{۳}\log_{۲}^{۳۲\times۲}} = \frac{۱}{\frac{۱}{۳}\left(\log_{۲}^{۳۲}+\log_{۲}^{۲}\right)} = \frac{۱}{\frac{۱}{۳}\left(\log_{۲}^{۳}+\log_{۲}^{۳}+\log_{۲}^{۲}\right)} = \frac{۱}{\frac{۱}{۳}(۱٫۶+۱٫۶+۱)}$$

$$\log_{۲}^{۳} = ۱٫۶$$

$$= \frac{۱}{\frac{۱۶}{۱۰}} = \frac{۱۰}{۱۶}$$

(۹)

$$\log_{۳}^{۴} = ۲\log_{۳}^{۲} = \frac{۱۰}{۸} \rightarrow \log_{۳}^{۲} = \frac{۱۰}{۱۶} \rightarrow \log_{۲}^{۳} = ۱٫۶ \rightarrow \log_{۲}^{۳}+\log_{۲}^{۲} = \boxed{\log_{۱۲}^{۶} = ۲٫۶}$$

$$\log_{۱۲}^{۶} = \frac{۱}{\log_{۶}^{۲\times۶}} = \frac{۱}{\log_{۶}^{۲}+\log_{۶}^{۶}} = \frac{۱}{\frac{۱۰}{۲۶}+\frac{۲۶}{۲۶}} = \frac{۲۶}{۳۶} = \frac{۱۳}{۱۸}$$

(۱۰)

$$a\log^{۲} - a + b\log^{۲} = \log^{۲}(a+b) - a = ۰ \Rightarrow \log^{۲} = \frac{a}{a+b}$$

$$\rightarrow \log_{۲}^{۱۰} = \frac{a+b}{a} \rightarrow \log_{۲}^{۱۰} - ۱ = \log_{۲}^{۱۰} - \log_{۲}^{۲} = \boxed{\log_{۲}^{۵} = \frac{b}{a}}$$

$$\Rightarrow \left(۲^{\frac{۱}{۲}}\right)^{\frac{b}{a}} = ۲^{\log_{۲}^{\sqrt{۵}}} = \sqrt{۵}$$