نام و نام خانوادگی : رزا محمدی — شماره تکلیف : ۲۴ — کلاس: سه شنبه ها گروه B دفتر یازدهم

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$f(x)=3^{Ax+B}$ ، $y=x^2$ ، $x_2=1$, $x_1=3$

$x=1 \to y=1 \to x=1 \to f(x)=1=3^{A+B} \to A+B=0$

$x=3 \to y=9 \to x=3 \to f(x)=9=3^{3A+B} \to 3A+B=2$] $2A=2 \to A=1$, $B=-1$

$f(x)=3^{x-1} \to x=0 \to 3^{-1}=\frac{1}{3}$] ← نقطه تلاقی

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$\log_2(4^x+15)=x+3 \to \log_2(4^x+15)=\log_2 2^{(x+3)}$

$2^x=t \to t^2+15=t\times 8 \to t^2-8t+15=0 \to (t-3)(t-5)=0$ ، $t=5$, $t=3$

$\to 2^x=5 \to x_1=\log_2^5$

$\to 2^x=3 \to x_2=\log_2^3$

مجموع جواب‌ها $=\log_2^3+\log_2^5=\log_2^{15}$]

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$(\log_{21}^3)^2+\log_{21}^{147}+\log_{21}^{1323}$

① $\to \log_{21}^{147}=\log_{21}^{21}+\log_{21}^{7}=1+(\log_{21}^{21}-\log_{21}^{3})=2-\log_{21}^{3}$

② $\to \log_{21}^{1323}=2\log_{21}^{21}+\log_{21}^{3}=2+\log_{21}^{3}$

$\to (\log_{21}^3)^2+(2-\log_{21}^3)\times(2+\log_{21}^3)=(\log_{21}^3)^2+4-(\log_{21}^3)^2=4$]

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$\log(x^2-2x+1)+3\log(1-x)=\log 10^5$

$(x^2-2x+1)\times(1-x)^3=10^5 \to (x-1)^2\times(x-1)^3\times -1=10^5 \to -(x-1)=10 \to x-1=-10$

$\to x=-9$] $\log_3^9=2$]

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$\log_2(x^2+2x+4)+\log_2(x-2)=3$

$\to (x^2+2x+4)(x-2)=8 \to (x+2)^2(x-2)=8 \to x^3-8=8 \to x^3=16 \to x=\sqrt[3]{16}$

$\log_{\sqrt[3]{2}}^{x}=\frac{\frac{4}{3}}{\frac{1}{3}}\log_2^2=4$)

$\log^{(1-x)} - \log \frac{1}{(x-2)^2} = 3 \to \frac{2-x}{\frac{1}{(x-2)^2}} = 10^3 \to (x-2)^2 \times (2-x) = 10^3 \to (x-2)^3 = -10^3$

$x-2 = -10 \to x = -8$ ۶

(د)

$\log_{\sqrt{2}}^{-x} \to \log_{\sqrt{2}}^{8} = 2\log_2^8 = 2\times 3 = 6$

$3^{x^2-2} = 81^x \to 3^{x^2-2} = 3^{4x} \to x^2-2 = 4x \to x^2 - 4x - 2 = 0$

$x = 2 \pm \sqrt{6}$, $x > 2$

✓ $2+\sqrt{6}$

✗ $2-\sqrt{6}$

$\log_6^{(x-2)} = \log_6^{(2+\sqrt{6}-2)} = \log_6^{\sqrt{6}} = \frac{1}{2}$ (د) ۷

$\log_3^2 = \frac{5}{8} \to \frac{1}{\log_2^3} = \frac{5}{8} \to \log_2^3 = \frac{8}{5}$

$\log_{18}^8 = \frac{\log_2^8}{\log_2^{18}} = \frac{3}{\log_2^2 + \log_2^9} = \frac{3}{1+2\log_2^3} = \frac{3}{1+\frac{8}{5}\times 2} = \frac{3}{1+\frac{16}{5}} = \frac{5}{7}$ (د) ۸

$\log_4^3 = \frac{8}{10} \to \log_3^4 = \frac{10}{8} \to 2\log_3^2 = \frac{10}{8} \to \log_3^2 = \frac{10}{16} = \frac{5}{8}$

$\log_{12}^6 = \frac{\log_3^6}{\log_3^{12}} = \frac{\log_3^3 + \log_3^2}{\log_3^3 + 2\log_3^2} = \frac{1+\frac{5}{8}}{1+\frac{10}{8}} = \frac{13}{18}$ (د) ۹

$(a\log^2)x^2 + ax + b\log^2 = 0 \xrightarrow{x=1} a\log^2 - a + b\log^2 = 0 \to (a+b)\log^2 = a$

$\to (1+\frac{b}{a})\log^2 = 1 \to 1 + \frac{b}{a} = \frac{1}{\log^2} \to \frac{b}{a} = \log_2^{10} - 1$ (د)

$\frac{b}{a} = \log_2^5 - \log_2^2 + 1 = \log_2^5 - 1 + 1 \to \frac{b}{a} = \log_2^5 \Rightarrow \sqrt{2}^{\frac{b}{a}} = \sqrt{2}^{\log_2^5}$ ۱۰

$\to 5^{\log_2^{\sqrt{2}}} = 5^{\frac{1}{2}} = \sqrt{5}$