به نام خدا

۲۰/ فاطمه متقی - ۲۴

(۱ دو تابع برابرند به ازای $x=1 \rightarrow 3^{A+B}=1 \rightarrow A+B=\log_3^1=0$

$x=3 \rightarrow 3^{3A+B}=3^2 \rightarrow 3A+B=2$ $\Big\}\Rightarrow \begin{matrix} A=1 \\ B=-1 \end{matrix}$

$\Rightarrow$ محل تلاقی با محور y $\xrightarrow{x=0} 3^B \rightarrow 3^{-1}=\frac{1}{3}$ ✓

(۲ $\log_2^{(4^x+15)}=x+3 \rightarrow 2^{x+3}=2^{2x}+15 \rightarrow 4^x-8(2^x)+15=0$

$t=2^x \rightarrow t^2-8t+15=0 \rightarrow (t-3)(t-5)=0 \rightarrow 2^x=3 \rightarrow x=\log_2^3$ ✓

$\Rightarrow \log_2^3+\log_2^5=\log_2^{15}$ ↳ $2^x=5 \rightarrow x=\log_2^5$

(۳ $(\log_{21}^3)^2+(\log_{21}^{21}+\log_{21}^7)(\log_{21}^{21^2}+\log_{21}^3) \xrightarrow{\log_{21}^3=t}$

$\log_{21}^{21}-\log_{21}^3$ ✓

$\Rightarrow t^2+(2-t)(2+t) \Rightarrow t^2+4-t^2=4$

(۴ $x^2-2x+1=(1-x)^2 \Rightarrow \log_{10}^{(1-x)^2}+3\log_{10}^{1-x}=5$

$5\log_{10}^{1-x}=5 \rightarrow \log_{10}^{1-x}=1 \rightarrow 1-x=10 \rightarrow x=-9$ ✓

$\log_3^9=2$

(۵ $\log^{(x^2+2x+4)(x-2)}=\log_2^8 \rightarrow x^3-8=8 \rightarrow x^3=16 \rightarrow x=\sqrt[3]{16}$

↳ $\log_{\sqrt[3]{2}}^{\sqrt[3]{16}} \rightarrow \log_2^{16} \rightarrow \log_2^{2^4}=4$ ✓

(۶ $\log(2-x)(x-2)^2=3 \rightarrow (2-x)^3=1000 \rightarrow 2-x=10 \rightarrow x=-8$

↳ $\log_{\sqrt{2}}^8 \rightarrow \log_{2^{\frac{1}{2}}}^{2^3}=\frac{3}{\frac{1}{2}}=6$ ✓

Arman

به نام خدا

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$3^{x^2-2} = 3^{4x} \rightarrow x^2-4x-2=0 \xrightarrow{\Delta} x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \Delta = 16+8=24$ (۷

$x = \frac{4 \pm 2\sqrt{6}}{2} \rightarrow 2 \pm \sqrt{6} \begin{cases} 2-\sqrt{6} \times \\ 2+\sqrt{6} \checkmark \end{cases} \Rightarrow \log_4^{\sqrt{6}} = \frac{1}{2}$ ۶

$\log_{18}^{8} = 3\log_{18}^{2} = \frac{3}{\log_2^9 + \log_2^2} = \frac{3}{2\log_2^3 + 1}$ $\left(\log_2^3 = \frac{8}{5}\right)$ (۸

$\frac{3}{2 \times \frac{8}{5} + 1} = \frac{15}{21} = \frac{5}{7}$ ۶

$\log_{12}^{4} = \frac{\log_6^4}{\log_6^{12}} = \frac{\log_6^3 + \log_6^2}{\log_6^3 + \log_6^6} = \frac{0/8 + 0/5}{0/8 + 1} = \frac{1/3}{1/8} = \frac{13}{18}$ (۹ ۶

$x=-1 \rightarrow a\log 2 - a + b\log 2 = 0 \rightarrow b\log 2 = a(1-\log 2)$ (۱۰

$\hookrightarrow \frac{b}{a} = \frac{1-\log 2}{\log 2} \Rightarrow \frac{\log 10 - \log 2}{\log 2} = \frac{\log \frac{10}{2}}{\log 2} = \log_2^5 \Rightarrow \frac{b}{a} = \log_2^5$ ۶

$(\sqrt{2})^{\frac{b}{a}} = (\sqrt{2})^{\log_2^5} = 5^{\log_2^{\sqrt{2}}} = 5^{\frac{1}{2}} = \sqrt{5}$