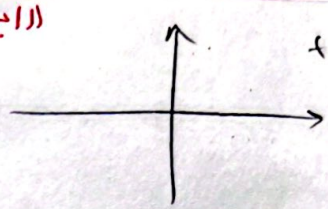
«امیرعلی وحید» «گروه A»

-۱

$3^{Ax+B} = x^2 \rightarrow 3^{3A+B} = 3^2 \rightarrow \begin{cases} 3A+B=2 \\ A+B=0 \end{cases}$

$3^{A+B} = \underbrace{1}_{3^0} \rightarrow A+B=0$

$2A=2 \rightarrow A=1, B=-1$



$f(x)=3^{x-1}$

$\alpha = \frac{1}{3}$

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$2^{2x}+15=2^{x+3} \longrightarrow 2^x=t \rightarrow t^2-8t+15=0$

$(t-5)(t-3) \Rightarrow t=5,3 \rightarrow \begin{cases} 2^x=3 \rightarrow \log_2^3=x \\ 2^x=5 \rightarrow x=\log_2^5=x \end{cases} \Rightarrow \log_2^3+\log_2^5$

$\log_2^{15}$

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$\log_{21}^3=a$

$\log_{21}^7=b$

$\log_{21}^{21}=1 \xrightarrow{\text{پس}} a+b=1$, $147=3\times 7^2 \rightarrow \log_{21}^{147}=a+2b \rightarrow a^2+(a+2b)(a+2)$

$1323=3\times 21^2 \rightarrow \log_{21}^{1323}=a+2$

$b=1-a$

$a+2b=a+2(1-a)=2-a$

$(2-a)(a+2)=4-a^2 \longrightarrow a^2+4-a^2=4$

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$\cancel{(x^2-2x+1)}(1-x)^3=10^5 \rightarrow (t^2)(-t)^3=10^5 \rightarrow -t^5=10^5 \rightarrow -t=10$

$(x-1)^2$

$x-1=t$

$-x+1=10 \rightarrow -x=9$

$x=-9$

$\log_3^{3^2}$

-۵

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

$x^3+\cancel{2x^2}+\cancel{4x}-\cancel{2x^2}-\cancel{4x}-8=8 \rightarrow x^3-16=0 \rightarrow x^3=2^4 \rightarrow x=2^{\frac{4}{3}} \rightarrow \log_2^{2^{\frac{4}{3}}}$

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$\frac{(2-x)}{\frac{1}{(x-2)^2}}=10^3 \rightarrow \frac{-t}{\frac{1}{\frac{1}{t^2}}}=-t^3=10^3 \rightarrow -t=10 \rightarrow t=-10 \rightarrow x-2=-10 \rightarrow x=-8$

$x-2=t$

$\log_2^{2^{-3}}$

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

$\log_6^{2+\sqrt{6}-2=\sqrt{6}} \rightarrow \log_6^{6^{\frac{1}{2}}}$

$\frac{1}{2}$

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$\log_{18}^{3} \rightarrow 2\log_{18}^{3} \rightarrow \frac{3}{\log_3^{18}} \rightarrow \frac{3}{\log_3^9+\log_3^2}=\frac{3}{1+2\log_3^2} \Rightarrow \frac{3}{1+\frac{16}{5}}=\frac{3}{\frac{21}{5}} \Rightarrow \frac{\frac{15}{1}}{\frac{21}{5}}=\frac{5}{7}$

-۹

$\frac{\log_3^6}{\log_3^{12}} \Rightarrow \frac{\log_3^2+\cancel{\log_3^3}^{1}}{\cancel{\log_3^3}^{1}+2\log_3^2}=\frac{1+\cancel{\log_3^2}\frac{10}{16}}{\cancel{2\log_3^2}\frac{10}{8}+1} \Rightarrow \frac{\frac{26+13}{16}}{\frac{18}{8}}=\frac{13}{18}$

$\frac{1}{\log_3^4}=\frac{8}{10}$

$\frac{1}{2\log_3^2}=\frac{8}{10} \rightarrow 2\log_3^2=\frac{10}{8} \rightarrow \log_3^2=\frac{10}{16}$

-۱۰

$a\log_{10}^2-a+b\log_{10}^2=0$

$\log_{10}^{2a}-a+\log_{10}^{2b}=0 \rightarrow \log_{10}^{2a}+\log_{10}^{2b}=\log_{10}^{a}$

$2^{ab}=2^a\times 5^a \longleftarrow 2^{ab}=10^a$

$2^b=5^a \rightarrow \sqrt[a]{2^b}=5 \rightarrow 2^{\frac{b}{a}}=5$

$2^{\frac{b}{2a}}=\sqrt{5}$

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