یازدهم تجربی $\underline{B}$ — معین نصری — تکلیف شماره $\underline{۲۴}$

①

$$f(x)=۳^{Ax+B},\quad y=x^{۲} \Longrightarrow \begin{cases} ۳^{Ax+B}=x^{۲} \xrightarrow{x=۱} ۳^{A+B}=۱ \Rightarrow A+B=۰ \\ ۳^{Ax+B}=x^{۲} \xrightarrow{x=۳} ۳^{۳A+B}=۳^{۲} \Rightarrow ۳A+B=۲ \end{cases}$$

$$\ominus\quad ۲A=۲ \Rightarrow \begin{cases}\boxed{A=۱}\\ \boxed{B=-۱}\end{cases}$$

$$f(x) \xrightarrow{x=۰} ۳^{B} = ۳^{-۱} = \frac{۱}{۳}$$

②

$$\log_{۲}^{(۴^{x}+۱۵)} = x+۳ \longrightarrow \underbrace{۲^{(x+۳)}}_{۸(۲)^{x}} = ۲^{۲x}+۱۵ \xrightarrow{۲^{x}=t\ *} ۸t=t^{۲}+۱۵$$

$$\Rightarrow t^{۲}-۸t+۱۵ \longrightarrow (t-۵)(t-۳)=۰ \begin{cases} t=۵ \\ t=۳ \end{cases} \xRightarrow{*} \begin{cases} ۲^{x}=۵ \longrightarrow \log_{۲}^{۵} \\ ۲^{x}=۳ \longrightarrow \log_{۲}^{۳} \end{cases}$$

$$\log_{۲}^{۵}+\log_{۲}^{۳} = \boxed{\log_{۲}^{۱۵}}$$

③

$$(\log_{۲۱}^{۳})^{۲}+\log_{۲۱}^{۱۴۷}\log_{۲۱}^{۱۳۲۳} \longrightarrow (\log_{۲۱}^{۳})^{۲}+\underbrace{\log_{۲۱}^{۲۱\times۷}\ \log_{۲۱}^{۲۱^{۲}\times۳}}$$

$$(\overset{۱}{\cancel{\log_{۲۱}^{۲۱}}}+\log_{۲۱}^{۷})(\overset{۲}{\cancel{\log_{۲۱}^{۲۱^{۲}}}}+\log_{۲۱}^{۳})$$

$$\log_{۲۱}^{\frac{۲۱}{۳}} = \overset{۱}{\cancel{\log_{۲۱}^{۲۱}}}-\log_{۲۱}^{۳}$$

$$\Rightarrow (\log_{۲۱}^{۳})^{۲}+(۲-\log_{۲۱}^{۳})(۲+\log_{۲۱}^{۳})$$

$$\longrightarrow \cancel{(\log_{۲۱}^{۳})^{۲}}+۴-\cancel{(\log_{۲۱}^{۳})^{۲}} = ۴$$

④

$$\log^{(x^{۲}-۲x+۱)}+۳\log^{(۱-x)}=۵ \xrightarrow{(x-۱)^{۲}=(۱-x)^{۲}} \log^{(۱-x)}+۳\log^{(۱-x)}=۵$$

$$\Rightarrow ۲\log^{(۱-x)}+۳\log^{(۱-x)}=۵ \longrightarrow \log^{(۱-x)}=۱ \longrightarrow ۱-x=۱۰$$

$$\boxed{x=-۹}$$

$$\log_{۳}^{(-x)} = ۲ \qquad -(-۹)=۹$$

$$\Rightarrow ۲$$

$\log_2^{(x^2+2x+4)} + \log_2^{(x-2)} = 3 \xrightarrow{\text{اتحاد فیل و فنجون}} \log_2^{x^3-8} = 3 \rightarrow x^3-8 = 8$ ⑤

$x^3 = 16$

$\boxed{x = 2^{\frac{4}{3}}}$

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

$\log^{(2-x)} - \log^{\frac{1}{(x-2)^2}} = 3 \xrightarrow{(2-x)^2=(x-2)^2} \log^{(2-x)} - \log^{(2-x)^{-2}} = 3$ ⑥

$\log^{(2-x)} = 1 \rightarrow 2-x = 10$

$\boxed{x = -8}$

$\log_{\sqrt{2}}^{(-x)} = \log_{2^{\frac{1}{2}}}^{2^3} = 6$

$3^{x^2-2} = 81^x \longrightarrow 3^{x^2-2} = 3^{4x} \longrightarrow x^2-4x-2 = 0$ ⑦

$\Delta = 16+8 = 24 \qquad \Rightarrow x_{1,2} = \frac{4\pm\sqrt{24}}{2}$

$\longrightarrow 2\pm\sqrt{6}$ غ ق ق $\Rightarrow x = 2+\sqrt{6} \qquad \log_6^{(x-2)} = \log_6^{\sqrt{6}} = \frac{1}{2}$

$\log_3^2 = \frac{5}{8}$

$\log_{18}^{8} = \frac{\log_3^8}{\log_3^{18}} = \frac{3\log_3^2}{\log_3^9+\log_3^2} = \frac{\frac{15}{8}}{2+\frac{5}{8}} = \frac{15}{21} = \frac{5}{7}$ ⑧

$\log_4^3 = \frac{8}{10}$

⑨

$\log_{12}^{6} = \frac{\log_4^6}{\log_4^{12}} = \frac{\log_4^3+\log_4^2}{\log_4^3+\log_4^4} = \frac{\frac{8}{10}+\frac{5}{10}}{\frac{8}{10}+\frac{10}{10}} = \frac{13}{18}$

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

$\Rightarrow \log^2 = \frac{a}{a+b} \longrightarrow \log_2^{10} = \frac{a+b}{a} \qquad \log_2^{10} = 1+\frac{b}{a} \longrightarrow \log_2^5 = \frac{b}{a} \longrightarrow 2^{\frac{b}{a}} = 5^{*}$ ⑩

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