* کیان جعفری *

Date Subject

① $x=1 \Rightarrow 3^{A+B}=1 \Rightarrow A+B=0$

$x=2 \Rightarrow 3^{2A+B}=9 \Rightarrow 2A+B=2 \Rightarrow A=1, B=-1$

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

② $(2^x)^2+15=2^{(x+2)} \Rightarrow (2^x)^2-8\cdot 2^x+15=0$

$2^{x_1}=5 \;\&\; 2^{x_2}=3$

$x_1=\log_2^5 \quad x_2=\log_2^3 \Rightarrow x_1+x_2=\log_2^{15}$

③ $(\log_{21}^3)^2+(\log_{21}^{21}+\log_{21}^7)(\log_{21}^{21^2}+\log_{21}^3)$

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

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

$\Rightarrow$ ④

④ $\log^{(1-x)^2}+\log^{(1-x)^3}=5\log^{(1-x)}=5$

$\Rightarrow 1-x=0 \Rightarrow x=-9 \Rightarrow \log_3^9=$ ②

⑤ $(x^2-2x+4)(x-1)=2^2 \Rightarrow x^3-8=0$

$\Rightarrow 2\times 2^2=x^3 \Rightarrow x=2^{\frac{3}{2}} \Rightarrow \log_{2^{\frac{1}{2}}}^{2^{\frac{3}{2}}}=\frac{3}{2}\times 2=$ ③

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⑦ $\log(2-x) - \log \frac{1}{(2-x)^2} = 3$

$\Rightarrow \log (2-x)^3 = 3 \Rightarrow (2-x)^3 = 1000$

$\Rightarrow 2-x = 10 \Rightarrow x = -8 \Rightarrow \log_{\sqrt{2}}^{8} = 6$

⑧ $2^{x^2-2} = 2^{4x}$ $\Rightarrow x^2 - 4x - 2 = 0$

$\frac{4 \pm \sqrt{16+8}}{2} = \frac{4 \pm \sqrt{24}}{2} = 2 \pm \sqrt{6}$

$\log_2^{(2x-1)^2}$ $\xrightarrow{x \neq 2-\sqrt{6}}$ $\log_2^{\sqrt{6}} \Rightarrow \frac{1}{2}$

⑨ $2 \log_{18}^{2}$ $\Rightarrow \log_{2}^{18} = \log_2^4 + 2\log_2^3 = 1 + \frac{2 \times 8}{5}$

$= \frac{21}{5} \Rightarrow 3 \times \frac{5}{21} = \frac{5}{7}$

⑩ $\log_{12}^{24} + \log_{12}^{2}$ $\Rightarrow \log_3^{12} = 2\log_3^2 + \log_3^3$

$2 \times \frac{10}{2 \times 8} + 1 = \frac{18}{8} \Rightarrow \frac{8}{18}$

$\log_{24}^{12} = 2\log_2^2 + \log_2^3$

$2 + 1/4 = \frac{9}{10} \Rightarrow \frac{10}{9}$

$\frac{8}{18} + \frac{10}{9} = \frac{9}{9} = \frac{12}{18}$

⑪ $(a+b) \times \log 2 = a \quad b \log 2 = a(1 - \log 2)$

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