سانیا جابری

(1) $f(x) = 3^{Ax+B}$ $\quad y = x^2$

$x = 1 , x = 3$

$f(1) = 1^2 = 1 \to 3^{A+B} = 1 \Rightarrow A+B = 0$

$3^{3A+B} = 9 = 3^2 \quad 3A+B = 2$

$$\boxed{f(0) = 3^{A(0)+B} = 3^{-1} = \frac{1}{3}}$$

$\begin{cases} A+B = 0 \\ 3A+B = 2 \end{cases}$

$2A = 2 \to A = 1$

$B = -1$

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

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

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

$\Rightarrow t^2+15 = 2^{x+3} = 8t \to t^2 - 8t + 15 = 0$

$(t-3)(t-5) = 0$

$\boxed{t = 3}$ $\quad t = 5$

$\Rightarrow 2^x = 3 \Rightarrow x = \log_2 3$

$2^x = 5 \Rightarrow x = \log_2 5 \to \log_2 3 + \log_2 5 = \log_2 (15)$

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

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

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

$21 = 3 \times 7 \qquad a = \log_{21} 3$

$147 = 3 \times 7^2 \qquad \log_{21}(3\times 7) = 1$

$1323 = 3^3 \times 7^2 \qquad b = \log_{21} 7$

$a+b = 1 \to b = 1-a$

$\log_{21}(147) = a+2b$

$\log_{21}(1323) = 3a+2b \to (a+2b)(3a+2b)$

$a+2b = a+2(1-a) = 2-a \qquad 3a+2b = 3a+2(1-a) = a+1$

سانیا جابری

(1) $F(x)=3^{Ax+B}$ $\quad y=x^2$

$x=1,\ x=3$

$F(1)=1^2=1 \rightarrow 3^{A+B}=1 \Rightarrow A+B=0$

$3^{3A+B}=9=3^2 \quad 3A+B=2$

$\boxed{F(0)=3^{A(0)+B}=3^{-1}=\frac{1}{3}}$

$\begin{cases} A+B=0 \\ 3A+B=2 \end{cases}$

$2A=2 \rightarrow A=1$

$B=-1$

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

$\log_2(2^{2x}+15)=x+3 \rightarrow t=2^x \rightarrow 2^{2x}=t^2$

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

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

$(t-3)(t-5)=0$

$\boxed{t=3} \quad t=5$

$\Rightarrow 2^x=3 \Rightarrow x=\log_2 3$

$2^x=5 \Rightarrow x=\log_2 5 \rightarrow \log_2 3+\log_2 5=\log_2(15)$

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

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

$21=3\times 7$ $\quad a=\log_{21} 3$ $\quad a^2+(4-a^2)=4$

$147=3\times 7^2$ $\quad \log_{21}(3\times 7)=1$

$1323=3^3\times 7^2$ $\quad b=\log_{21} 7$

$a+b=1 \rightarrow b=1-a$

$\log_{21}(147)=a+2b$

$\log_{21}(1323)=3a+2b \rightarrow a^2+(a+2b)(3a+2b)$

$a+2b=a+2(1-a)=2-a \quad 3a+2b=3a+2(1-a)=a+2$

سایا ماپرن

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

$\log_{\sqrt{2}}(-x) = ?$

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

$(x-2)^2 = (2-x)^2 \rightarrow \log(2-x)^3 = 3$

$3\log(2-x) = 3 \Rightarrow \log(2-x) = 1$

$2 - x = 10 \Rightarrow x = -8$

$\log_{\sqrt{2}}(-x) = \log_{\sqrt{2}} 8$ $\quad 8 = 2^3$ $\quad \sqrt{2} = 2^{\frac{1}{2}}$

$= \frac{3}{1/2} = 6$

$3^{x^2-2} = 81^x$

$\log_6(x-2)$

$3^{x^2-2} = 3^{4x}$

$x^2 - 2 = 4x \rightarrow x^2 - 4x - 2 = 0 \quad x = 2 \pm \sqrt{6}$

$x - 2 > 0 \Rightarrow x > 2 \quad x = 2 + \sqrt{6}$

$\log_6(x-2) = \log_6 6^{\frac{1}{2}} \rightarrow \log_6 6^{\frac{1}{2}} = \frac{1}{2}$

سانیا مادری

$\log_{۳}^{۲} = \frac{۵}{۸}$ $\qquad \log_{۱۸}^{۸} = ?$

$a = \log_{۳}^{۲} = \frac{۵}{۸} = \log_{۱۸}^{۸} = \frac{\log_{۳}^{۸}}{\log_{۳}^{۱۸}}$

$\log_{۳}^{۸} = \log_{۳}^{۲^{۳}} = ۳\log_{۳}^{۲} = ۳a = \frac{۱۵}{۸}$

$\log_{۳}^{۱۸} = \log_{۳}^{(۲\times۳^{۲})} = \log_{۳}^{۲} + ۲ = a+۲ = \frac{۵}{۸}+۲ = \frac{۲۱}{۸}$

$\log_{۱۸}^{۸} = \frac{\frac{۱۵}{۸}}{\frac{۲۱}{۸}} = \boxed{\frac{۱۵}{۲۱} = \frac{۵}{۷}}$

$\log_{۴}^{۳} = ۰/۸ = \frac{۴}{۵} \to \frac{\log_{۲}^{۳}}{\log_{۲}^{۴}} = \frac{\log_{۲}^{۳}}{۲} = \frac{۴}{۵}$

$\log_{۱۲}^{۶}$ $\qquad \log_{۲}^{۳} = \frac{۸}{۵}$

$\log_{۱۲}^{۶} = \frac{\log_{۲}^{۶}}{\log_{۲}^{۱۲}} \to \log_{۲}^{۶} = \log_{۲}^{(۲\times۳)} = ۱+\log_{۲}^{۳} = ۱+\frac{۸}{۵} = \frac{۱۳}{۵}$

$\log_{۱۲}^{۶} = \frac{\frac{۱۳}{۵}}{\frac{۱۸}{۵}} = \boxed{\frac{۱۳}{۱۸}}$

$(a\log۲)x^{۲} + ax + b\log۲ = ۰$ $\qquad x=-۱$ $\qquad (\sqrt{۲})^{\frac{b}{a}} = ?$

$(a\log۲)(۱) + a(-۱) + b\log۲ = ۰$ $\qquad a\log۲ - a + b\log۲ = ۰$

$(a+b)\log۲ - a = ۰$

$(a+b)\log۲ = a$ $\qquad (\sqrt{۲})^{\frac{b}{a}} = ۲^{\frac{۱}{۲}(\frac{۱}{\log۲}-۱)}$

$(۱+\frac{b}{a})\log۲ = ۱$ $\qquad \log_{۱۰}(۲)^{-۱} = \log^{۲^{-۱}}$

$۱+\frac{b}{a} = \frac{۱}{\log۲} \to \frac{b}{a} = \frac{۱}{\log۲} - ۱$ $\qquad (\sqrt{۲})^{\frac{b}{a}} = (۲^{\frac{۱}{۲}})^{\log_{۲}^{۵}} = \boxed{۲^{\frac{۱}{۲}\log_{۲}^{۵}} = \sqrt{۵}}$