تکلیف شماره   یازدهم دخترانه A   لرزا مختی

①

$f(x) = 3^{Ax+B}$, $y = x^2$ $\Rightarrow$ $3^{Ax+B} = x^2$ $\Rightarrow$ $3^{Ax+B} = 1$ $\Rightarrow$ $A x^1 + B = 0$

$A = -B$

$3^{Ax+B} = 3^2 \Rightarrow 3 \times A + B = 2 \Rightarrow 3(-B) = 2 - B \Rightarrow B = -1 , A = 1$

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

②

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

$\underbrace{2^x}_{t} \times 8 = 2^{2(x)} + 15 \Rightarrow 8t = t^2 + 15 \Rightarrow t^2 - 8t + 15 = 0$

$\Leftarrow t = 3, 5$

$2^x = 3 , 2^x = 5 \Rightarrow \log_2^3 = x$

$\log_2^5 = x \Rightarrow \log_2^3 + \log_2^5 = \underline{\log_2^{15}}$

③

$(\log_{21}^3)^2 + \log_{21}^{147} \times \log_2^{1323} \Rightarrow (\log_{21}^3)^2 + (\log_{21}^{21} + \log_{21}^7) \times (2\log_{21}^{21} + \log_{21}^3)$

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

④

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

$\log(1-x)^2$, $\log(1-x)^3$

$5\log^{(1-x)} = 5 \Rightarrow \log^{1-x} = 1 \Rightarrow 1 - x = 10 \Rightarrow \underline{x = -9}$

⑤

$\log_2^{(x^2+2x+4)} + \log_2^{(x-2)} = 3 \Rightarrow \log_2 \overbrace{(x^2+2x+4)(x-2)}^{(x^3-8)} = 3$

$x^3 - 8 = 2^3 \Rightarrow x^3 = 8 + 8 \Rightarrow x^3 = 16 \Rightarrow x = \sqrt[3]{16}$

$\log_{\sqrt[3]{2}}^{\sqrt[3]{16}} = y \Rightarrow (\sqrt[3]{2})^y = \sqrt[3]{16} \Rightarrow \underline{y = 4}$

$\sqrt[3]{16} = 2\sqrt[3]{2}$

(6)

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

$\log^{(2-x)^3} = 3 \Rightarrow 3\log^{(2-x)} = 3 \Rightarrow \log^{(2-x)} = 1 \Rightarrow 2-x = 10 \Rightarrow \underline{x=-8}$

$\log_{\sqrt{2}}^{(-x)} \Rightarrow \log_{\sqrt{2}}^{+8} = \underline{6}$

(7)

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

$81^x \to 3^{4x}$

$\Delta = 16-(4)(-2) = 24 \Rightarrow x = \dfrac{4\pm\sqrt{24}}{2} = 2\pm\sqrt{6}$ غ ق ق

$\log_6^{(x-2)} = \log_6^{(2+\sqrt{6}-2)} = \log_6^{\sqrt{6}} = \underline{\dfrac{1}{2}}$

(8)

$\log_3^2 = \dfrac{5}{8} \qquad \log_{18}^8 = 3\log_{18}^2 = 3\times\dfrac{\log_3^2}{\log_3^{18}} = 3\times\dfrac{\frac{5}{8}}{2+\frac{5}{8}} = \underline{\dfrac{5}{7}}$

$\log_3^{18} \to \log_3^9 + \log_3^2$

(9)

$\log_4^3 = 0.8 \qquad \log_{12}^6 = \dfrac{\log_4^6}{\log_4^{12}} = \dfrac{\overset{0.8}{\log_4^3} + \overset{\frac{1}{2}}{\log_4^2}}{\underset{1}{\log_4^4} + \underset{0.8}{\log_4^3}} = \dfrac{1.3}{1.8} = \underline{\dfrac{13}{18}}$

(10)

$(a\log_{10}^2)x^2 + ax + b\log_{10}^2 = 0$

$x_1 = -1 \Rightarrow a\log_{10}^2 - a + b\log_{10}^2 = 0 \Rightarrow \log_{10}^2(a+b) = a \Rightarrow \log_{10}^2 = \dfrac{a}{a+b} \quad \dfrac{1}{\log_{10}^2} = \dfrac{a+b}{a} = 1+\dfrac{b}{a} \Rightarrow$

$\dfrac{b}{a} = \dfrac{1}{\log_{10}^2} - 1 \Rightarrow \dfrac{b}{a} = \log_2^{10} - \underset{\log_2^2}{1} \Rightarrow \dfrac{b}{a} = \log_2^5 \Rightarrow (2^{\frac{1}{2}})^{\log_2^5} \Rightarrow 5^{\log_2^{2^{\frac{1}{2}}}} = \underline{\sqrt{5}}$