تاریخ: / /

موضوع:

تابع نمایی و لگاریتمی — تکلیف کلاس ۲۱۴ — پاسخ تشریحی

① $f(x) = 3^{Ax+B}$

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

$y = x^2 \to x=1 \Rightarrow y=1$

$\to x=2 \Rightarrow y=9$

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

$2A = 2 \to \underline{A=1} \quad \underline{B=-1}$

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

② $\log_3^{2^x+15} = x+3 \to 3^{x+3} = 2^x + 15 \to (3^3)^x - 1 = (3^x)^2 + 15$

$a = 3^x \to a^2 - a - 12 = 0$

$a = 4 \to 3^x = 4 \to x = \log_3^4$

$a = 5 \to 3^x = 5 \to x = \log_3^5$

$x_1 + x_2 = \log_3^4 + \log_3^5 = \underline{\log_3^{20}}$

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

$\left(\log_{21}^3\right)^2 + \left(\log_{21}^7 + 1\right)\left(\log_{21}^9 + 2\right)$

$\left(\log_{21}^3\right)^2 + \left(2 - \log_{21}^3\right)\left(\log_{21}^3 + 2\right) = \left(\log_{21}^3\right)^2 - \left(\log_{21}^3\right)^2 + 4 = \underline{4}$

④ $\log\left(x^2 - 2x + 1\right) + 3\log(1-x) = 5$

$2\log(1-x) + 3\log(1-x) = 5 \to \log(1-x) = 1 \to 1-x = 10$

$\underline{x = -9}$

⑤ $\log_3^{-x} = \log_3^9$

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⑥ $\log_2^{(x^2+2x+4)} + \log_2^{(x-2)} = 3 \rightarrow \log_2^{(x^2+2x+4)(x-2)} = 3$

$\log_2^{x^3-8} = 2 \rightarrow x^3 = 16 \rightarrow x = \sqrt[3]{16}$

$\log_{\sqrt[3]{2}}^{x} - \log_{2^{\frac{1}{3}}}^{16^{\frac{1}{3}}} = \boxed{4}$

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④ $\log(2-x) - \log\frac{1}{(x-2)^2} = 3 \rightarrow \log(2-x) - \log(x-2)^{-2} = 3$

$3\log(2-x) = 3 \rightarrow 2-x = 10$

$\boxed{x = -8}$

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

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

$\Delta = 24 \rightarrow x = \frac{4 \pm 2\sqrt{6}}{2}$

$x = 2 - \sqrt{6}$ ✗ ج ق ق

$x = 2 + \sqrt{6}$ ✓

$\log_4^{(x-2)} = \log_4^{\sqrt{6}} = \boxed{\frac{1}{2}}$

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⑧ $\log_{18}^{8} = \frac{1}{\log_8^{18}} = \frac{1}{\frac{1}{3}(\log_2^{18})} = \frac{1}{\frac{1}{3}(1+2\log_2^3)} =$

$\frac{1}{\frac{1}{3}(1+2\times\frac{8}{5})} = \frac{1}{\frac{21}{15}} = \frac{15}{21} = \boxed{\frac{5}{7}}$

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موضوع:

$$\log_{12}^{9} = \frac{\log_4^9}{\log_4^{12}} = \frac{\log_4^2 + \log_4^2}{\log_4^4 + \log_4^3} = \frac{\frac{1}{2} + 0.8}{1 + 0.8} = \frac{1.3}{1.8} = \frac{13}{18}$$ ④

$$x = -1 \rightarrow a\log 2 - a + b\log 2 = 0$$ ⑮

$$(a+b)\log 2 = a \rightarrow \log_{10}^2 = \frac{a}{a+b}$$

$$\log_2^{10} = \frac{a+b}{a}$$

$$\log_2^2 + \log_2^5 = \frac{a+b}{a}$$

$$\log_2^5 = \frac{b}{a}$$

$$(\sqrt{2})^{\frac{b}{a}} = \sqrt{2}^{\log_2^5} = 5^{\log_2^{\sqrt{2}}} = \boxed{\sqrt{5}}$$
