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ریاضی هفتم پاسخ تمرین دوم

① $f(x) = 3^{Ax+B}$

1	3
1	9

$y = x^2$ $\xrightarrow{x=1}$ $y=1$

$\xrightarrow{x=3}$ $y=9$

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

$3^{3A+B} = 3^2 \rightarrow 3A+B=2$

$2A=2 \rightarrow A=1 \rightarrow B=-1$

if $x=0 \rightarrow 3^{-1} = \frac{1}{3}$

② $\log_2^{4^{x+2}} = x+3$

$4^{x+3} = 4^3 + 15$

$2^{2x} - 2^{x+3} + 15 = 0$

$t \leftarrow (2^x)^2 - 8(2^3) + 15 = 0 \rightarrow t^2 - 8t + 15 = 0$

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

$t=3 \rightarrow 2^x = 3 \rightarrow x = \log_2^3$

$t=5 \rightarrow 2^x = 5 \rightarrow x = \log_2^5$

$\log_2^5 + \log_2^3 = \log_2^{15}$

③ $(\log_{21}^3)^2 + \log_{21}^{(17)^{7\times 21}} \log^{(441)^{21\times 21\times 3}}_{21}$

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

$\log_{21}^7 = \log_{21}^{21} - \log_{21}^3 = 1 - \log_{21}^3$

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

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۴) $\log^{m^2-2m+1}_{(1-m)} + 3\log^{(1-m)}_{3} = 5$

$\log^{(1-m)^2}_{(1-m)} + 3\log^{1-m}_{3} = 5$ $\quad \log^{9}_{3} = 2$

$5\log^{(1-m)}_{(1-m)} = 5 \longrightarrow 1-m = 10 \rightarrow m = -9$

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۵) $\log^{m^2+2m+4}_{2} + \log^{m-2}_{2} = 3$ $\quad \log^{m}_{\sqrt[3]{4}}$

$\log^{m^3-1}_{2} = 3 \longrightarrow 8 = m^3 - 1 \rightarrow m^3 = 9 \rightarrow m = \sqrt[3]{9}$

$\log^{\sqrt[3]{16}}_{\sqrt[3]{2}} = \frac{\frac{4}{3}}{\frac{1}{3}}\log^{2}_{2} = 4$

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۶) $\log^{(2-m)} - \log^{\frac{1}{(m-2)^2}} = 3$ $\quad \log^{(-m)}_{\sqrt{2}}$

$\log^{(m-2)^{-2}} = 3 \longrightarrow -3\log^{2-m} = 3$

$\log^{2-m} = -1$

$2-m = 10 \rightarrow m = -8$ $\quad \log^{+8}_{\sqrt{2}} = \frac{3}{\frac{1}{2}}\log_2 = 6$

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۷) $\log^{2}_{3} = \frac{a}{1}$ $\quad \log^{1}_{18} = \frac{\log^{\frac{1}{2}}_{2}}{\log^{18}_{2}} = \frac{-1}{\log^{9}_{2} + \log^{2}_{2}}$

$\frac{-1}{1+2\log^{3}_{2}} = \frac{-1}{\frac{21}{3}} = \frac{3}{7}$

$\log^{3}_{2} = a$

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$\log_{۴}^{۳} = ۰/۸$ $\log_{۱۲}^{۶} = ?$ (۴)

$\log_{۱۲}^{۶} = \frac{\log_{۲}^{۶}}{\log_{۲}^{۱۲}} = \frac{\log_{۲}^{۳}+۱}{\log_{۲}^{۳}+۲} = \frac{۱/۶+۱}{۱/۶+۲}$

$\frac{۱}{۲}\log_{۲}^{۳} = \frac{۵}{۱۰} \rightarrow \log_{۲}^{۳} = ۱/۶$ $\frac{۲/۶}{۳/۶} = \frac{۱۳}{۱۸}$

$(a\log^{۲})m^{۲} + ۲am + b\log^{۲} = ۰$ (۱۲) $(\sqrt{۲})^{\frac{b}{a}}$

$m=-۱ \rightarrow a\log^{۲} - a + b\log^{۲} = ۰ \rightarrow \log^{۲} = y$

$ay - a + by = ۰ \xrightarrow{\div a} y - ۱ + \frac{b}{a}y = ۰ \rightarrow y - \frac{b}{a}y = ۱$

$۱ - \frac{b}{a} = \frac{۱}{\log^{۲}} \rightarrow ۱ - \frac{b}{a} = \log_{۲}^{۱۰} \rightarrow ۱ - \frac{b}{a} = ۱ + \log_{۲}^{۵}$

$\frac{b}{a} = -\log_{۲}^{۵}$ $\sqrt{۲}^{-\log_{۲}^{۵}} = ۵^{-\frac{۱}{۲}} = \frac{۱}{\sqrt{۵}}$

سوال ۷

$\log^{m-۲}$ (۹) $= ?$ $۳^{m^{۲}-۱} = ۸۱^{m} = ۳^{۴m}$

$m^{۲}-۱ = ۴m \rightarrow m^{۲} - ۴m - ۱ = ۰$

$m-۲ = -\sqrt{۹} \rightarrow m = -\sqrt{۹}+۲$ ق ق ق

$(m-۲)^{۲} = ۹ \rightarrow m-۲ = \sqrt{۹} \rightarrow m = \sqrt{۹}+۲$ ق ق ✓

$\log_{۹}^{۲+\sqrt{۹}-۲} = \log_{۹}^{\sqrt{۹}} = \frac{۱}{۲}$