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نام و نام خانوادگی ...حسین یلدریمی خواه... پاسخنامه تشریحی تکلیف شماره ..۲۴.. کلاس ...یازدهم (A)...

$y = x^2 \begin{cases} x=1 \longrightarrow y=1 \\ x=3 \longrightarrow y=9 \end{cases}$ $f(x) = 3^{Ax+B} \to f(0) = 3^{B} = 3^{-1} = \frac{1}{3}$

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$f(x) = 3^{Ax+B} \begin{cases} x=1 \to f(x)=1 \to 3^{A+B}=1 \to A+B=0 \\ x=3 \to f(x)=3 \to 3^{3A+B}=9 \to 3A+B=2 \end{cases} \to A=1,\ B=-1$ ۱

$\log_2^{(4^x+15)} = x+3 \to 2^{x+3} = 4^x+15 \Rightarrow 8(2^x) = (2^x)^2+15$

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$2^x = t \longrightarrow t^2-8t+15=0 \begin{cases} t=3 \\ t=5 \end{cases}$ $\log_2 3 + \log_2 5 = \log_2 15$ ۲

$2^x = 3 \to x = \log_2^3$ $4^x+15>0$ همواره برقرار ⟶ هر دو جواب قابل قبول

$2^x = 5 \to x = \log_2^5$ $2^{(x+3)} > 2^{2x} \to x<3$

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

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$(\log_{21}^3 \times \log_{21}^3) + (\log_{21}^3 + \log_{21}^7 + \log_{21}^7)(\log_{21}^3 + \log_{21}^3 + \log_{21}^3 + \log_{21}^7 + \log_{21}^7)$ ۳

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

$= (\log_{21}^3 \times \log_{21}^3) + (\log_{21}^7 \times \log_{21}^3) + 4 = \log_{21}^3(\log_{21}^3 + \log_{21}^7) + 4 = \log_{21}^3 + 4$

$\log^{(x^2-2x+1)} + 3\log^{(1-x)} = 5$ $\log_3^{-x} = \log_3^{-(-9)} = \log_3^9 = 2$

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

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$\log((x-1)^5(-1)) = 5 \to (x-1)^5(-1) = 10^5$ ۴

$\xrightarrow{\text{توان فرد}} (x-1)^5 = (-10)^5 \Rightarrow x-1 = -10 \Rightarrow x=-9 \xrightarrow{\text{به ازای } -9} \begin{cases} x^2-2x+1>0 \\ 1-x>0 \end{cases}$

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

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

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$\log_{\sqrt[3]{2}}^{x} = \log_{\sqrt[3]{2}}^{\sqrt[3]{16}} = \frac{3}{3}\log_2^{16} = 1 \times 4 = 4$

$\log^{(2-x)} - \log^{\frac{1}{(x-2)^2}} = 3 \longrightarrow \log^{(2-x)(x-2)^2} = 3 \longrightarrow (2-x)(x-2)^2 = 1000$

$(x-2)^3 = -1000$

$\sqrt[3]{(x-2)^3} = \sqrt[3]{-1000}$ ۱ ۶

$x-2 = -10$

$x = -8$

$0 < 2-x \xleftarrow{\text{برای } -8}$

$\log_{\sqrt{2}}^{-(x)} = \log_{\sqrt{2}}^{-(-8)} = 2\log_2^8 = 2\times 3 = 6$

$3^{x^2-2} = 81^x \longrightarrow 3^{x^2-2} = 3^{4x} \longrightarrow x^2-2 = 4x \qquad x^2-4x-2=0 \begin{cases} x = 2+\sqrt{6} \\ x = 2-\sqrt{6} \end{cases}$

$\log_6^{(x-2)} = ? \quad \xrightarrow{x=2+\sqrt{6}} \quad x-2 = \sqrt{6}$ قابل قبول

$\xrightarrow{x=2-\sqrt{6}} \quad x-2 = -\sqrt{6}$ غیرقابل قبول $\longrightarrow \log_6^{(x-2)} = \log_6^{\sqrt{6}}$ ۰/۵ ۷

$\log_6^{\sqrt{6}} = \frac{1}{2}\log_6^2 = \frac{1}{2}\times\frac{1}{\log_2^6} = \frac{1}{2}\times\frac{1}{\log_2^2+\log_2^3} = \frac{1}{2}\times\frac{1}{1+\log_2^3} = \frac{1}{2+2\log_2^3}$

$\log_3^2 = \frac{5}{8} \qquad \log_{18}^8 = 3\log_{18}^2 = \frac{3}{\log_2^{18}} = \frac{3}{\log_2^9+\log_2^2} = \frac{3}{2\log_2^3+1} =$

$\hookrightarrow \log_2^3 = \frac{8}{5} \longrightarrow \frac{3}{2(\frac{8}{5})+1} = \frac{3}{\frac{16}{5}+1} = \frac{3}{\frac{21}{5}} = 3\times\frac{5}{21} = \frac{5}{7}$ ۱ ۸

$\log_4^3 = \frac{8}{10} \qquad \log_{12}^6 = \log_{12}^2 + \log_{12}^3 = \frac{1}{\log_2^{12}} + \frac{1}{\log_3^{12}} =$ ۱

$= \frac{1}{\log_2^4+\log_2^3} + \frac{1}{\log_3^4+\log_3^3} = \frac{1}{2+\log_2^3} + \frac{1}{1+\log_3^4} = \frac{1}{2+2\log_4^3} + \frac{1}{1+\log_3^4}$ ۹

$\hookrightarrow \log_3^4 = \frac{10}{8} \longrightarrow \frac{1}{2+2(\frac{8}{10})} + \frac{1}{1+\frac{10}{8}} = \frac{1}{2+\frac{8}{5}} + \frac{1}{1+\frac{10}{8}} = \frac{1}{\frac{18}{5}} + \frac{1}{\frac{18}{8}} = \frac{5+8}{18} = \frac{13}{18}$

$(a\log^2)x^2 + ax + b\log^2 = 0 \qquad x_1 = -1 \longrightarrow x_1\times x_2 = \frac{-b\log^2}{a\log^2} \rightarrow -x_2 = \frac{-b\log^2}{a\log^2}$

ریشه دوم معادله $\boxed{x_2 = \frac{b}{a}}$ ۰/۵

$x_1 = -1 \longrightarrow x_1 + x_2 = \frac{-a}{a\log^2} \rightarrow -1+x_2 = \frac{-a}{a\log^2} \hookrightarrow x_2 = 1 - \frac{a}{a\log^2} = 1 - \log_2^{10}$ ۱۰

$(\sqrt{2})^{\frac{b}{a}} = (\sqrt{2})^{1-\log_2^{10}} = (\sqrt{2})^{\log_2^{\frac{2}{10}}} = (\frac{2}{10})^{\log_2^{\sqrt{2}}} = (\frac{2}{10})^{\frac{1}{2}} = \sqrt{\frac{2}{10}} = \sqrt{\frac{1}{5}} = \frac{1}{\sqrt{5}} = \boxed{\frac{\sqrt{5}}{5}}$

۳) $(\log_{۲۱}^{۳})^{۲} + \log_{۲۱}^{۷۲۱} \log_{۲۱}^{۶۳×۲۱} = (\log_{۲۱}^{۳})^{۲} + (\log_{۲۱}^{۷} + \log_{۲۱}^{۲۱})(\log_{۲۱}^{۶۳} + \log_{۲۱}^{۲۱})$

$= (\log_{۲۱}^{۳})^{۲} + (\log_{۲۱}^{\frac{۲۱}{۳}} + ۱)(۱ + \log_{۲۱}^{۲۱×۳})$

$= (\log_{۲۱}^{۳})^{۲} + (۱ - \log_{۲۱}^{۳} + ۱)(۱ + ۱ + \log_{۲۱}^{۳})$

$= (\log_{۲۱}^{۳})^{۲} + (۲ - \log_{۲۱}^{۳})(۲ + \log_{۲۱}^{۳}) = ۴$

۷) $x^{۲} - ۴x - ۲ = ۰ \rightarrow x_{۱} = ۲ + \sqrt{۶}\ \checkmark,\quad x_{۲} = ۲ - \sqrt{۶}\ \times$

$\log_{۶}^{x-۲} = \log_{۶}^{\sqrt{۶}} = \frac{۱}{۲}$

۱۰) $(a\log^{۲}) - a + b\log^{۲} = ۰ \rightarrow a(۱ - \log^{۲}) = b\log^{۲}$

$\rightarrow a\log^{۵} = b\log^{۲} \rightarrow \frac{b}{a} = \log_{۲}^{۵} \rightarrow (\sqrt{۲})^{\log_{۲}^{۵}} = \sqrt{۵}$