نام و نام خانوادگی ...نازنین کریمی...... پاسخنامه تشریحی تکلیف شماره ...۲۳... کلاس ...یازدهم A...

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$\log_{mn}^{m^2n}=b \longrightarrow \frac{\log_n^{m^2n}}{\log_n^{mn}}=b \longrightarrow \frac{\log_n^{m^2}+\log_n^{n}}{\log_n^{m}+\log_n^{n}}=b \longrightarrow$

$\frac{2\log_n^m+1}{\log_n^m+1} \xrightarrow{\log_n^m=a} \frac{2a+1}{a+1}=b \Rightarrow b=\overbrace{2-\frac{1}{a+1}}^{\text{بین ۱ و ۲}} \xrightarrow{0<a<1} [b]=[2^-]=1$

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الف) $\sqrt{\frac{x}{\log_{\frac12}^x}} \Rightarrow \frac{x}{\log_{\frac12}^x}\geq 0 \xrightarrow{x>0 \ (1)} \log_{\frac12}^x>0 \Rightarrow x<1 \ (2) \to 1\cap 2 \Rightarrow x\in(0,1)$

ب) $\frac{\log_4(x^2-x-2)}{\sqrt{x^2-1}+1} \Rightarrow x^2-x-2>0 \Rightarrow (x+1)(x-2)>0 \to$ (1)

$x^2-1\geq 0 \Rightarrow x^2\geq 1 \Rightarrow x\geq 1 \ , \ x\leq -1$ (2)

$1\cap 2 \Rightarrow (-\infty,-1)\cup(2,+\infty)$

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$2\log_9^a+\log_a^{\sqrt9}=2 \Rightarrow 2\log_{3^2}^a+\log_a^3=2 \Rightarrow \log_3^a+\log_a^3=2 \Rightarrow$

$\log_3^a+\frac{1}{\log_3^a}=2 \xrightarrow{\log_3^a=t} t+\frac1t=2 \Rightarrow t^2-2t+1=0 \Rightarrow (t-1)^2=0 \Rightarrow t=1$

$\log_3^a=1 \Rightarrow \boxed{a}=3^1=\boxed{3}$

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$(\log\frac{5}{3})x^2+(\log 9)x-\log 15=0 \Rightarrow (\overset{0,7}{\log 5}-\overset{0,4}{\log 3})x^2+(\overset{0,8}{2\log 3})x-(\overset{0,7}{\log 5}+\overset{0,4}{\log 3})=0$

$\log 2=0,3 \Rightarrow \log\frac{10}{5}=0,3 \Rightarrow \overset{1}{\log 10}-\log 5=\frac{3}{10} \Rightarrow \boxed{\log 5=0,7} \Rightarrow 0,3x^2+0,8x-1,1=0$

اختلاف ریشه‌ها

$3x^2+8x-11=0 \Rightarrow (x-1)(3x+11)=0 \to x=1 , -\frac{11}{3} \Rightarrow 1-(-\frac{11}{3}) \Rightarrow \frac{14}{3}$

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$\log_2^7=2,8$

$\log_5^2=0,5$

$\log_{14}^{10}=?$

$\log_2^5=\frac{1}{\log_5^2}=\frac{1}{0,5}=2$

$\log_{14}^{10}=\frac{\log_2^{10}}{\log_2^{14}}=\frac{\log_2^5+\log_2^2}{\log_2^7+\log_2^2}=\frac{\log_2^5+1}{\log_2^7+1}=\frac{2+1}{2,8+1} \Rightarrow \frac{3}{3,8}=\frac{30}{38}=\boxed{\frac{15}{19}}$

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$$\left.\begin{array}{l}\log_3 5 = 1.5\\ \log_2 3 = 1.6\end{array}\right\} \xrightarrow{\text{ضرب}} \log_3 5 \times \log_2 3 \Rightarrow \frac{\log 5}{\cancel{\log 3}} \times \frac{\cancel{\log 3}}{\log 2} = \frac{\log 5}{\log 2} = \log_2 5 = 1.5 \times 1.6 = \boxed{2.4}$$

$$\boxed{\log_5 2} = \frac{1}{2.4} = \frac{1}{\frac{24}{10}} \Rightarrow \frac{10}{24} = \boxed{\frac{5}{12}}$$

$$\log_{15} 6 = ? \Rightarrow \frac{\log 2}{\cancel{\log 3}} \times \frac{\cancel{\log 3}}{\log 5} = \frac{\log 2}{\log 5} = \boxed{\log_5 2 = \frac{5}{12}} \simeq \boxed{0.42}$$

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$$\log_8 18 = m \qquad \log_4 12 = ?$$

$$\log_8 18 = \frac{\log 18}{\log 8} = \frac{2\log 3 + \log 2}{3\log 2} = m \Rightarrow \frac{\log 3}{\log 2} = \frac{3m-1}{2}$$

$$\log_4 12 = 1 + \log_4 3 = 1 + \frac{1}{2}\left(\frac{3m-1}{2}\right) = \boxed{\frac{3}{4}(m+1)}$$

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$$(0.4)^{2x-1} = \left(\frac{125}{8}\right)^{x^2} \xrightarrow[\frac{4}{10} = \frac{2}{5}]{\frac{125}{8} = \left(\frac{5}{2}\right)^3} \left(\frac{2}{5}\right)^{2x-1} = \left(\frac{5}{2}\right)^{3x^2} \xRightarrow{\left(\frac{5}{2}\right) = \left(\frac{2}{5}\right)^{-1}}$$

$$\left(\frac{2}{5}\right)^{2x-1} = \left(\frac{2}{5}\right)^{-3x^2} \Longrightarrow 2x-1 = -3x^2 = 3x^2+2x-1 = 0 \Rightarrow (3x-1)(x+1) = 0$$

$$x \begin{cases} \frac{1}{3} \checkmark \\ -1 \ \text{غ ق ق} \end{cases} \qquad \log_8 (9x+1) \Rightarrow 9x+1 > 0 \Rightarrow x > -\frac{1}{9}$$

برای ۱- ، ۹x+1 درست نیست.

$$\log_8 (3+1) \Rightarrow \frac{2}{3}\log_2 2 = \frac{2}{3} \Leftarrow \text{جواب}$$

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$$\log_2 3 = a \Rightarrow 2^a = 3 \ , \ \log_8 b = \frac{2}{3}(1+a) \Rightarrow 2^{2(1+a)} = b$$

$$\left(2^{1+a}\right)^2 = b \Rightarrow (2 \times 2^a)^2 = b \Rightarrow (2 \times 3)^2 = b \Rightarrow \boxed{b = 36}$$

$$\log(3b-8) = \log(3 \times 36 - 8) = \log 100 = \boxed{2}$$

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$$2a = b + c \Rightarrow b = 2a - c \Rightarrow \frac{1}{x_1+x_2} = \frac{1}{S} = \frac{4a}{b} = \frac{4a}{2a-c} = \log 4 = 2\log 2$$

$$\frac{2a}{2a-c} = \log 2 \Rightarrow \frac{2a-c}{2a} = \log_2 10 \Rightarrow 1 - \log_2 10 = \frac{c}{2a} \Rightarrow \boxed{2 - \log_2 100 = \frac{c}{a}} \Rightarrow$$

$$\left(\sqrt[8]{\frac{1}{2}}\right)^{\frac{c}{a}} = \left(2^{-\frac{1}{8}}\right)^{\frac{c}{a}} = \left(2^{2-\log_2 100}\right)^{-\frac{1}{8}} = \left(\frac{2^2}{2^{\log_2 100}}\right)^{-\frac{1}{8}} = \left(\frac{4}{100}\right)^{-\frac{1}{8}} = (25)^{\frac{1}{8}} = 5^{\frac{1}{4}} = \sqrt[4]{5}$$