Subject : خانه‌سازی   ۱۴٫۷۵   Date: ۱۲/۳   تکلیف

① $n^9 = m$

$\log_{mn}^{m^2 n} = b \Rightarrow \log_{n^9 \times n}^{n^{2a} \times n} = b \rightarrow \frac{2a+1}{a+1} \log_n^n = b$

$\hookrightarrow \log_{n^{a+1}}^{n^{2a+1}}$ $\quad \left[\frac{a+a+1}{a+1}\right] = [b]$ ۵

$\left[1 + \frac{a}{a+1}\right] = [b] = 1 + \left[\frac{a}{a+1}\right] = [b] \rightarrow 0 < \frac{a}{a+1} < 1$

$[b] = 1$

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② الف) $y = \sqrt{\frac{x}{\log_{\frac{1}{2}}^{x}}}$

$x > 0$ ①

$\log_{\frac{1}{2}}^{x} \neq 0 \Rightarrow x \neq 1$

$+ \; \underset{0}{\phi} \; \underset{1}{\phi} \; -$ $\rightarrow (0,1) = D_f$

ب) $\dfrac{\log_4^{x^2-x-2}}{\sqrt{x^2-1}+1}$ $\quad x^2-x-2 > 0$, $x = -1$, $x = -\frac{c}{a} = 2$ ۵

$\sqrt{x^2-1} \neq -1$ ✓ $\quad$ $+ \; \underset{-1}{0} \; - \; \underset{2}{0} \; +$

$x^2-1 \geq 0$

$(x-1)(x+1) \geq 0$

$\underset{-1}{+ \; \phi} \; - \; \underset{+1}{\phi} \; +$ $\quad -1 \quad 1 \quad 2$

$D_f = (-\infty,-1) \cup (2,+\infty)$

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③ $2\log_x^9 + \log_a^{x^{\frac{1}{2}}} \Rightarrow 2\log_{x}^{9} + \frac{1}{2}\log_a^x \Rightarrow 4\log_x^a = 2$

$\hookrightarrow 2\log_x^a$ $\quad \log_x^a = \frac{2}{4}$ ۵

$a = x^{\frac{1}{2}} \Rightarrow x = 9 \rightarrow a = 9^{\frac{1}{2}} \rightarrow \sqrt{9} \rightarrow a = 3$

Subject: Date:

(۴)

$(\log 5-\log 3)x^2+(2\log 2)x-(\log 3+\log 5)=0$

جمع ضریب‌ها ← $x=1$ و $x=\frac{c}{a}$

$\frac{c}{a}=\frac{-\log 3-\log 5}{\log 5-\log 3}=\frac{-0.48-\log 10+\log 2}{\log 10-\log 2-0.48}=\frac{-0.48-1+0.3}{1-0.3-0.48}=-\frac{11}{3}$

$\left|-\frac{11}{3}-1\right|=\frac{14}{3}$ ← ۱ جمله

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(۵)

$\log_5 2\times\log_2 7\Rightarrow 0.5\times 2.8\Rightarrow \log_5 7=1.4$

$\log_{14} 10=\frac{\log_5 10}{\log_5 14}$

$\log_{14} 10=\frac{\log_5 2+\log_5 5}{\log_5 2+\log_5 7}\Rightarrow\frac{0.5+1}{0.5+1.4}\Rightarrow\frac{1.5}{1.9}=\frac{15}{19}$

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(۶)

$\log_3 5\times\log_2 3=\log_2 5=2.4$

$\log_{15} 6=\frac{\log_2 6}{\log_2 15}=\frac{\log_2 2+\log_2 3}{\log_2 3+\log_2 5}=\frac{1+1.6}{1.6+2.4}=\frac{2.6}{4}\Rightarrow\frac{13}{20}=0.65$

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(۷)

$\log_4 12=\frac{\log_8 12}{\log_8 4}\Rightarrow\log_8 12=\log_8 4+\log_8 3\rightarrow\frac{2}{3}+\frac{1}{3}\log_2 3$

$\log_8 4=\frac{2}{3}\log_2 2\Rightarrow\frac{2}{3}$

$\log_8 18=m\rightarrow\log_8 9+\log_8 2=m\Rightarrow\frac{2}{3}\log_2 3+\frac{1}{3}\log_2 2=m$

یا $\frac{2}{3}\log_2 3+\frac{1}{3}=m$

$\log_2 3=\frac{3m-1}{2}$

$\log_4 12=\frac{\frac{2}{3}+\frac{1}{3}\log_2 3}{\frac{2}{3}}\Rightarrow\frac{\frac{2}{3}+\frac{1}{3}\left(\frac{3m-1}{2}\right)}{\frac{2}{3}}=\frac{3}{4}(m+1)$

Subject : Date:

(۸)

$$\left(\frac{4}{10}\right)^{2x-1} = \left(\frac{5^3}{2^3}\right)^{x^2} = \left(\frac{2}{5}\right)^{2x-1} = \left(\frac{5}{2}\right)^{3x^2}$$

$$2x-1 = -3x^2$$

$$3x^2+2x-1=0 \xrightarrow{\text{درست}} x^2+2x-3$$

$$(x+3)(x-1)$$

$$x = \frac{-3}{3} \text{ و } \frac{1}{3}$$

غ ق ق $x=-1 \rightarrow$

$9x+1 \Rightarrow -9+1=-8$ نباید منفی شود.

$$x=\frac{1}{3} \checkmark \rightarrow \log_{2^3} 2^2 \rightarrow \frac{2}{3}\log_2 2 =$$

پاسخ $\frac{2}{3}$

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(۹)

$$\frac{1}{3}\log_2 b = \frac{2}{3}(a+1) \rightarrow \log_2 b = 2a+2$$

$$2^{2a+2} = b \qquad (2^9)^2 \times 4 = 36 \rightarrow b = 36$$

$$\log(3b-8) = \log(100) = 2$$

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(۱۰)

$$5 = 1+\frac{b}{4a} = \log 4 \rightarrow \underset{(1)}{\frac{a}{b}} = \frac{\log 4}{4} = \frac{2\log 2}{2} \Rightarrow \log_2 2$$

$$2a = b+c \xrightarrow{\text{تقسیم بر } b} \frac{2a}{b} = 1+\frac{c}{b} \rightarrow \frac{a}{b} = \frac{\log 2}{2} \rightarrow 2\left(\frac{\log 2}{2}\right) = 1+\frac{c}{b}$$

$$(2)\ \frac{c}{b} = -1+\log 2 \xrightarrow{(1),(2)} \frac{c}{a} = \frac{-1+\log 2}{\frac{\log 2}{2}} \Rightarrow \frac{c}{a} = \frac{\log 2 - \log 10}{\frac{1}{2}\log 2} \Rightarrow$$

$$\frac{\log \frac{2}{10}}{\frac{1}{2}\log 2} = \frac{\log \frac{1}{5}}{\frac{1}{2}\log 2} \rightarrow \log_{\sqrt{2}} \frac{1}{5} \rightarrow \left(\frac{1}{a\sqrt{2}}\right)^{\frac{c}{a}} \rightarrow \left(\frac{1}{5}\right)^{\log_{\sqrt{2}} \frac{1}{\sqrt{2}}} \rightarrow \log_{2} 2^{-\frac{1}{4}} \ \left(\frac{1}{5}\right)$$

پاسخ $\log\left(\frac{1}{5}\right)^{-\frac{1}{4}} = \sqrt[4]{5}$