Page : ( )   ۹ ریاضی دهم C   نامه تکلیف ۲۳   Date :

۱۵٫۵

۱- $\log_n m = a$, $\log_{mn} m^2 n = b$, $a > 0$

$m = n^a$

$\log_{mn} m^2 n = b \to \log_{n^{a+1}} n^{2a+1} = b \to \frac{2a+1}{a+1} = b \,,\, a > 0 \Rightarrow 1 < \frac{2a+1}{a+1} < 2 \Rightarrow 1 < b < 2$

$\Rightarrow [b] = 1$

۲- $y = \sqrt{\frac{x}{\log_{\frac{1}{2}} x}} = \sqrt{\frac{x}{-\log_2 x}}$

$\frac{x}{-\log_2 x} \geq 0$ (۲) $\Rightarrow \log_2 x < 0 \to x < 1$

$-\log_2 x \neq 0$

$x > 0$ (۲)

(الف)

۰٫۵

۳- $2\log_9 a + \log_a 3 = 2 \Rightarrow \frac{1}{\log_3 a} + \log_3 a = 2 \to (\log_a 3 - 1)^2 \to \log_a 3 = 1$

$\log_9 a = \log_3 a$ ... $\frac{}{\log_3 a}$

$\Rightarrow a = 3$

(د)

۴- $(\log 5 - \log 3)x^2 + (2\log 4)x - (\log 3 + \log 5) = 0$

$\log 5 = \log 10 - \log 2 = 1 - 0/3 = 0/7$

$\Rightarrow 0/4x^2 + 0/8x - 1/1 = 0 \to 4x^2 + 8x - 11 = 0 \Rightarrow x_1 = -1 \,,\, x_2 = \frac{11}{4} \Rightarrow x_2 - x_1 = \frac{14}{4}$

(ج)

۵- $\log \frac{5}{2} = 2 \to \log \frac{5}{2} + \log \frac{2}{2} = \log \frac{10}{2} = 3$

$\log \frac{7}{2} + \log \frac{2}{2} = 3/8 = \log \frac{14}{10}$

$\to \frac{\log_{10} 14}{\log_{10} 2} = \frac{\log_2 10}{\log_{14} 10} = \frac{3}{\log_{14} 10} = 3/8 \Rightarrow \log_{14} 10 = 1/4$

(۱)

۶- $\log_{3} 2 + \log_3 3 = \log_3 6 = 1/625$

$\log_3 5 + \log_3 3 = \log_3 15 = 2/5$

$\log_{15} 6 = \frac{\log_3 6}{\log_3 15} = \frac{1/625}{2/5} = 0/65$

(ب)

$\log_2^n + \log_2^6 + \log_2^3 = 3m = \log_2^3 + \log_2^2 + \log_2^3 \Rightarrow 2\log_2^3 = 3m-1$ −۷

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

$\log_4^{12} = \log_4^3 + \log_4^4 = \frac{1}{2}\log_2^3 + 1 = \frac{3m-1}{4} + \frac{4}{4} = \frac{3m+3}{4}$ (۲)

$\log \quad (\frac{5}{2})^{-2x+1} = (\frac{5}{2})^{3x^2} \Rightarrow -2x+1 = 3x^2 \Rightarrow 3x^2+2x-1=0$ −۸ (۲)

$\Rightarrow \begin{cases} x=-1 \to \text{غ ق ق} \to 9(-1)+1<0 \\ x=\frac{1}{3} \to \frac{1}{3}\times 9+1>0 \ \text{ق ق} \Rightarrow \log_8^{9x+1} = \log_{2^3}^{2^2} = \frac{2}{3} \end{cases}$

$\log_2^b = 2 + 2a = 2 + 2\log_2^3 = 2\log_2^2 + 2\log_2^3 = 2\log_2^6 = \log_2^{36}$ −۹

$\Rightarrow b = 36 \Rightarrow \log(3b-8) = \log^{100} = 2$ (۲)

$a = \frac{c+b}{2}$ $\quad \frac{4a}{b} = \log^4 = 2\log 2 \Rightarrow \frac{2a}{b} = \log_{10}^2$ (۵) −۱۰

$\frac{c+b}{b} = \log^2$

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

$\to \frac{2a}{2a-c} = \log^2 \xrightarrow{\text{معکوس}} \frac{2a-c}{2a} = \log_2^{10} \to 1-\log_2^{10} = \frac{c}{2a} \to 2-\log_2^{100} = \frac{c}{a}$ (1)

$(\frac{1}{\sqrt[8]{2}})^{\frac{c}{a}} = (2^{-\frac{1}{8}})^{\frac{c}{a}} = (2^{\frac{c}{a}})^{-\frac{1}{8}} \xrightarrow{(1)} (2^{2-\log_2^{100}})^{-\frac{1}{8}}$

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

۱۱ (الف

$\frac{x}{\log_{\frac{1}{2}}^x} \geq 0 \to \log_2^x < 0 \to x < 2^0 = 1 \to \begin{cases} x>0 \\ x<1 \end{cases} \to D = (0,1)$

۱۱ (ب

$\sqrt{x^2-1} \to (-\infty,-1] \cup [1,+\infty)$ (1)

$\log_4^{x^2-x-2} \to x^2-x-2>0 \to (-\infty,-1) \cup (2,+\infty)$ (2)

$\xrightarrow{(1)\cap(2)} (-\infty,1) \cup (2,+\infty)$

۵)

$$\frac{\text{لگ}_{۲}^{۵} + \text{لگ}_{۲}^{۳}}{\text{لگ}_{۲}^{۷} + \text{لگ}_{۲}^{۳}} = \frac{۲+۱}{۲,۸+۱} = \frac{۱۵}{۱۹}$$