۱۸,۵

نام و نام خانوادگی ...ملاین املاک... پاسخنامه تشریحی تکلیف شماره ...۲۳... کلاس یازدهم تجربی B

۱	$\log_n^m = a \quad \log_{mn}^{m^2 n} = b \quad a>0 \quad [b]=? \Rightarrow \boxed{[b]=1}$ $m=n^a$ $b=\log_{mn}^{m^2n} \Rightarrow (n^a)^2 n = n^{2a}\times n = n^{2a+1}$ $mn \Rightarrow n^a \times n = n^{a+1}$ $\Rightarrow b=\frac{2a+1}{a+1}=\frac{2a+2-1}{a+1}=2-\frac{1}{a+1} \Rightarrow 1<b<2$ $a>0 \Rightarrow a+1>1$ ۲
۲	الف) $y=\sqrt{\frac{x}{\log_{\frac{1}{2}}^{x}}} \Rightarrow x>0$ $\log_{\frac12}^x \neq 0 \Rightarrow x\neq 1$ $D_f=(0,+\infty)-\{1\}$ $\frac{x}{\log_{\frac12}^x}\geq 0 \Rightarrow x\geq 0$ ب) $y=\frac{\log_2^{(x^2-x-2)}}{\sqrt{x^2-1}+1}$ $x^2-x-2>0 \quad \Delta=1+8=9$ $x=\frac{1\pm 3}{2}\begin{cases}2\\-1\end{cases}$ $\quad \begin{array}{ccc} & -1 & 2 \\ + & - & + \end{array}$ $x<-1 \;,\; x>2$ $x^2-1\geq 0 \Rightarrow x^2\geq 1 \Rightarrow x\geq 1 \;,\; x\leq -1 \;\; \cup$ $D_f=(-\infty,-1)\cup(2,+\infty)$ ۱,۵ $\frac{x}{\log_{\frac12}^x}\geq 0 \to \log_2^x<0 \to x<2^0=1 \to \begin{cases}x>0\\x<1\end{cases} \to D=(0,1)$
۳	$2\log_x^a+\log_a^{\sqrt{x}}=2 \quad , \quad x=9 \quad a=?$ $2\log_{\underset{3^2}{9}}^a+\log_a^{\sqrt{3^2}}=2 \Rightarrow \frac{2}{\underbrace{\log_a^{3^2}}_{2\log_a^3}}+\log_a^3-2=0 \Rightarrow \frac1t+t-2=0 \xrightarrow{\times t} t^2-2t+1=0$ $\quad (\log_a^3=t)$ $\Delta=4-4=0 \quad t=+1 \quad \log_a^3=1 \Rightarrow \boxed{a=3}$ ۲
۴	$\log 2=0/3 \;,\; \log 3=0/4$ $(\log\frac{5}{3})x^2+(\log 9)x-\log 15=0 \Rightarrow 0/3x^2+0/8x-1/1=0 \xrightarrow{\times 10} 3x^2+8x-11=0$ $\log 3^2=2\log 3=0/8$ $\log 15=\log\frac{30}{2}=\log 30-\log 2=\log 3+\log 10-\log 2=0/4+1-0/3=\boxed{1/1}$ $\quad (30=3\times 10)$ $\log\frac{5}{3}=\underbrace{\log 5}_{\log\frac{10}{2}}-\log 3=\log 10-\log 2-\log 3=1-0/3-0/4=\boxed{0/3}$ $\Delta=64+132=196$ $x=\frac{-8\pm 14}{6}\begin{cases}+1\\ \frac{-22}{6}=-\frac{11}{3}\end{cases}$ اختلاف ریشه‌ها $=\boxed{\frac{14}{3}}$ $1-(-\frac{11}{3})$ ۲
۵	$\log_2^7=2/8 \;,\; \log_5^2=0/5$ $\log_2^5=\frac{1}{\underset{0/5}{\log_5^2}}=2$ $\log_{14}^{10}=? =\log_{2\times 7}^{2\times 5}=\frac{\log_2^{10}}{\log_2^{14}}=\frac{\log_2^5+\log_2^2}{\log_2^2+\log_2^7}=\frac{1+2}{1+2/8}=\frac{3}{3/8}$ $\simeq \boxed{0/79}$ ۲

۶

$\log_3 5 = 1.5 \,,\ \log_2 3 = 1.6$

$\log_{15=5\times3}^{6=2\times3} = ?$

$\hookrightarrow \dfrac{\log_3 6}{\log_3 15} = \dfrac{\log_3 2 + \log_3 3}{\log_3 5 + \log_3 3} = \dfrac{\overset{0.625}{\frac{10}{16}+1}}{1.5+1} = \dfrac{1.625}{2.5} = \boxed{0.65}$

$\log_5 3 = \dfrac{1}{\underbrace{\log_3 5}_{1.5}} = \dfrac{2}{3}$

$\log_3 2 = \dfrac{1}{\underbrace{\log_2 3}_{1.6}} = \dfrac{10}{16}$

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$\log_{8=2\times4}^{18=2\times9} = m$

$\log_{4=2\times2}^{12=4\times3} = \dfrac{\log_2 12}{\log_2 4} = \dfrac{2\log_2 2 + \log_2 3}{2} = 1 + \dfrac{\log_2 3}{2} = 1 + \dfrac{\frac{3m-1}{2}}{2} = 1 + \dfrac{3m-1}{4} = \boxed{\dfrac{3m+3}{4}}$

$\dfrac{\log_2 18}{\underbrace{\log_2 8=2^3}_{3\log_2 2}} = \dfrac{\log_2 18}{3} = \dfrac{\log_2 2 + \log_2 9=3^2}{3} = \dfrac{\log_2 2 + 2\log_2 3}{3} = m \Rightarrow 1 + 2\log_2 3 = 3m$

$\Rightarrow 2\log_2 3 = 3m-1$

$\Rightarrow \log_2 3 = \dfrac{3m-1}{2}$

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$\left(\underbrace{\dfrac{125}{8}}\right)^{x^2} = \underbrace{(0.4)}^{2x-1}$

$\left(\left(\dfrac{5}{2}\right)^3\right)^{x^2} = \left(\dfrac{\cancel{4}\,2}{\cancel{10}\,5}\right)^{2x-1} = \left(\dfrac{5}{2}\right)^{-2x+1}$

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

$\Delta = 16 \qquad x = \dfrac{-2\pm4}{6} \begin{cases} \frac{1}{3} \\ -1 \end{cases}$

$\log_8^{(9x+1)} = \begin{cases} x = \frac{1}{3} \Rightarrow \log_{8=2^3}^{4=2^2} = \boxed{\frac{2}{3}} \\ x = -1 \Rightarrow \log_8^{-8} \rightarrow \text{ت‌ن} \end{cases}$

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۹

$\log_2 3 = a \qquad \log_8 b = \dfrac{2}{3}(1+a) \qquad \log(3b-8) =$

$\log_{2^3} b = \dfrac{2}{3}(1+a) \Rightarrow \dfrac{1}{\cancel{3}}\log_2 b = \dfrac{2}{\cancel{3}}(1+a) \Rightarrow \log_2 b = \underbrace{2}+\underbrace{2a}$

$\underbrace{\log_2 4 + 2\log_2 3}_{\log_2 9} = \log_2 36$

$\Rightarrow \log_2 b = \log_2 36$

$\Rightarrow \boxed{b = 36}$

$\log(3\times36-8) = \boxed{2}$

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۱۰

جمع ریشه‌ها $S = -\dfrac{b}{a} = \dfrac{-b}{-4a} = +\dfrac{b}{4a} \Rightarrow \dfrac{1}{S} = \dfrac{4a}{b} = \log 4 = 2\log 2 \Rightarrow \dfrac{2a}{b} = \log 2 \Rightarrow b = \dfrac{2a}{\log 2}$

$a = \dfrac{b+c}{2} \Rightarrow 2a = b+c \Rightarrow 2a = \dfrac{2a}{\log 2} + c \Rightarrow c = 2a - \dfrac{2a}{\log 2} \Rightarrow c = 2a\left(1-\dfrac{1}{\log 2}\right) \Rightarrow \dfrac{c}{a} = 2\left(1-\dfrac{1}{\log 2}\right)$

$\log 2 \simeq 0.3 \Rightarrow \dfrac{c}{a} \simeq -4 \qquad -\dfrac{c}{8a} = \dfrac{4}{8} = \dfrac{1}{2}$

$\left(\dfrac{1}{\sqrt[8]{2}}\right)^{\frac{c}{a}} = \left(\dfrac{1}{2^{\frac{1}{8}}}\right)^{\frac{c}{a}} = \left(2^{-\frac{1}{8}}\right)^{\frac{c}{a}} = 2^{-\frac{c}{8a}}$

$\Rightarrow 2^{\frac{1}{2}} = \boxed{\sqrt{2}}$

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

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

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

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