امتحان [illegible] - یازدهم سری A تجربی

۱)

$$\log_n m = a \rightarrow \frac{\log m}{\log n} = a$$

$$b = \log_{mn} m^2 n \Rightarrow \frac{2\log m + \log n}{\log m + \log n} = \frac{2a+1}{a+1} = 1 + \frac{a}{a+1}$$

$$\Rightarrow 1 < b < 2$$

$$\boxed{[b]=1}$$

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۲)

الف) $y = \sqrt{\dfrac{x}{\log_{\frac{1}{2}} x}}$, $x>0$ و

$$\rightarrow \log_{\frac{1}{2}} x \neq 0 \rightarrow \boxed{x \neq 1}$$

$$\rightarrow \frac{x}{\log_{\frac{1}{2}} x} \geq 0 \rightarrow \begin{cases} x>0 \\ x \neq 1 \end{cases} \rightarrow \frac{x}{\log_{\frac{1}{2}} x} \geq 0 \checkmark \rightarrow D_f = (0,1)$$

ب) $y = \dfrac{\log (x^2-x-2)}{\sqrt{x^2-1}+1}$

$$\rightarrow x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0$$

$$\begin{array}{c|c|c} -1 & & 2 \\ + & - & + \end{array} \rightarrow (-\infty,-1)\cup(2,+\infty)$$

$$\rightarrow \sqrt{x^2-1} + 1 \neq 0 \rightarrow \sqrt{x^2-1} \neq -1 \checkmark$$

همواره

$$\Rightarrow \boxed{D_f : (-\infty,-1)\cup(2,+\infty)}$$

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۳)

$$2\log_{\cancel{16}} a + \log_a \sqrt{16} = 2 \rightarrow \frac{2}{2}\log_4 a + \log_a 4 = 2$$

$$\log_4 a + \log_a 4 = \log_4 a + \frac{1}{\log_4 a} = 2 \rightarrow \log_4 a = 1$$

$$\rightarrow \log_4 a = 1 \rightarrow \boxed{a=4}$$

امیرحسین لیدهراسی یازدهم ریاضی

۳)

$$\log\frac{5}{2} = \frac{\log 10}{\dots} - \log 2 = (\dots) - \log 2 = (\dots) - \frac{40}{100} = \boxed{\frac{3}{10}}$$

$\log 10 - \log 2$

0.3

$$\log 9 = \log(3\times3) = \log 3 + \log 3 = 0.8$$

$$\log 15 = \log(5\times 3) = \frac{\log 10}{\log 2} + \log 3 = (\log 2 \times \log 3) + \log 3 = \dots$$

$\frac{12}{100}$ $\frac{40}{100}$

$$x^2 + 0.8x + 0.\dots = 0 \to |x_2 - x_1| = \sqrt{S^2 - 4P} = \sqrt{\left(\frac{-b}{a}\right)^2 - 4\left(\frac{c}{a}\right)}$$

$$\Rightarrow \sqrt{\dots} \Rightarrow \sqrt{\left(\frac{-0.18}{0.12}\right)^2 - 4\left(\frac{1.1}{0.3}\right)} = \boxed{\frac{14}{3}}$$

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۵)

$$\log_2 7 = 2.8 \quad , \quad \log_5 2 = 0.5$$

$$\log_{14} 10 \to \frac{1}{\log_{14} 10} = \log_{10} 14 = \cancel{\log_{10} 10} + \log_{10} 4 = 1 + \log_{10} 4 = 1 + \frac{4}{15}$$

$$\to \log_{10} 14 = \frac{19}{15} \to \boxed{\log_{14} 10 = \frac{15}{19}}$$

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۶)

$$\log_2 5 = 1.5 \quad , \quad \log_2 3 = 1.6 \to \log_3 2 = \frac{10}{16}$$

$$\log_{15} 6 = \log_{(3\times5)}(3\times2) = \frac{\log 3 + \log 2}{\log 3 + \log 5} = \frac{5\times13}{5\times20} = \boxed{\frac{65}{100}}$$

[illegible] یازدهم [illegible]

7

$\log_8 18 = m \qquad \log_4 12 = \log_4 (4\times4\times4) = 3m - \frac{3}{4}$

$\log_8 (8\times8\times2) = m \to 8^m = 18 \to 4^m \times 2^m = 18 \to 2^{2m}\times 2^m = 2^{3m} = 18$

$\to 4^{O} = 12 \to 4^{O} = 12 \to 2^{2O} = 12 \to O = \boxed{3m+\frac{3}{4}}$

8

$\frac{\cancel{4^{2x-1}}}{10^{2x-1}} = \frac{125^{x^2}}{8^{x^2}} = \frac{(5^3)^{x^2}}{(2^3)^{x^2}}$

$\cancel{2^{2x-1}} \times 5^{2x-1}$

$\frac{2^{2x-1}}{5^{2x-1}} = \frac{(5^3)^{x^2}}{(2^3)^{x^2}} \to \log_8^{9x-1} = \cancel{\log_8^{8x}} \times \cancel{\log^{x-1}}$

$1 - \frac{1}{3} = \boxed{\frac{2}{3}}$

!!!مطمئن نیستم!!

9

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

$\log_8 3b = \frac{\log 3b}{\log 8} = \frac{3\times(\frac{2}{3})(a+1)}{\cancel{a+1}} = \cancel{3}\times\frac{2}{\cancel{3}} = 2$

10

$-4ax^2 + bx + \frac{1}{3}c = 0$ عکس مجموع ریشه‌ها $\Rightarrow \frac{1}{\frac{-b}{a}} = \frac{-a}{b} = \boxed{\frac{4a}{b}}$

$\to \boxed{\log 4 = \frac{4a}{b}} \quad , \boxed{2a = b+c}$

$\left(\frac{1}{\sqrt{2}}\right)^{\frac{c}{a}} = 2^{-\frac{1}{2}\times\frac{2a-b}{a}} = \sqrt{5}$

$\sqrt[4]{5} = \sqrt[4]{5}$

$\frac{2\times2\times2+2}{2} = 5$

!!این سوال را هم مطمئن نیستم!!