یازدهم تجربی B

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پرهام منفردی

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$\log_n m = a$

$\log_{mn} m^2 n = \log_{mn} m^2 + \log_{mn} n = \frac{2\log_n m}{\log_n mn} + \frac{\cancel{\log_n n}^{1}}{\log_n mn}$

$a>0$

$= \frac{2\log_n m}{\log_n m + \cancel{\log_n n}_{1}} + \frac{1}{\log_n m + \cancel{\log_n n}_{1}} = \frac{2\log_n m + 1}{\log_n m + 1} = \frac{2a+1}{a+1}$

$\left[\frac{2a+1}{a+1}\right] = 1$

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$y=\sqrt{\frac{x}{\log_{\frac12} x}}$ $\qquad x>0 \qquad \log_{\frac12} x > 0 \Rightarrow x<1$

$D_f = (0 \quad 1)$

$y=\frac{\log_e (x^2-x-2)}{\sqrt{x^2-1}+1}$ $\qquad x^2-x-2>0 \qquad (x-2)(x+1)$ $\qquad \begin{array}{ccccc} & -1 & & 2 & \\ + & | & - & | & + \end{array}$ $\qquad D_f=(-\infty \quad -1)\cup(2 \quad +\infty)$

$x^2-1>0 \qquad \begin{array}{ccccc} & -1 & & 1 & \\ + & | & - & | & + \end{array} \qquad \cap$

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

همیشه

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$2\log_x a + \log_a \sqrt{x} = 2 = 2\log_x a + \frac12 \log_a x = 2 = 2\log_x a + \frac{1}{2\log_x a} = 2$ $\qquad \log_x a = t$

$2t + \frac{1}{2t} = 2 \overset{\times 2t}{=} 4t^2+1-4t \Rightarrow (2t-1)^2 = 0$ $\qquad t=\frac12$

$\log_x a = \frac12 \quad \xrightarrow{x=9} \quad \log_9 a = \frac12$

$a=\sqrt9 = 3$

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$\log 2 = 0.3 \qquad \log 3 = 0.4$ $\qquad \log 5 = \log 10 - \log 2 = 1-0.3 = 0.7$

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

$(0.7-0.4)x^2 + (2\times 0.4)x - (0.7+0.4) = 0$

$0.3x^2 + 0.8x - 1.1$

$\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{0.64+1.32}}{0.3} = \frac{1.4}{0.3} = \frac{14}{3}$

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$\log_5 2 = 0.5 \qquad \log_2 7 = 2.8$

$\log 2 = 0.5\log 5 \qquad \log 7 = 2.8\log 2$

$2\log 2 = \log 5$

$\log_{14} 10 = \frac{\log 10}{\log 14} = \frac{\overset{2\log 2}{\cancel{\log 5}} + \log 2}{\underset{2.8\log 2}{\cancel{\log 7}} + \log 2} = \frac{3\cancel{\log 2}}{3.8\cancel{\log 2}} = \frac{3}{3.8} = \frac{15}{19}$

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$\log_3^5 = 1{,}5 \qquad \log_2^3 = 1{,}6$

$\log^5 = 1{,}5\log^3 \qquad \log^3 = 1{,}6\log^2$

$\frac{1}{1{,}6}\log^3 = \log^2$

$$\frac{\log^6}{\log^{15}} = \frac{\log^2 + \log^3}{\log^3 + \log^5} = \frac{\frac{2{,}6}{1{,}6}\log^3}{\frac{5}{2}\log^3} = \frac{13}{20}$$

$1{,}5\log^3$

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$\log_8^{18} = m$

$$\frac{1}{3}(\log_2^{18}) = m = \frac{1}{3}(2\log_2^3 + \log_2^2) = m$$

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

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

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

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

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

$$3x^2 + 2x - 1 = 0 \quad \begin{cases} -1 = x \\ \frac{1}{3} = x \end{cases}$$

$$\log_8^{(9x+1)} \begin{cases} \to \log_8^{-9+1} = \times \\ \log_8^4 = \frac{2}{3} \end{cases}$$

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$\log_2^3 = a$

$$\log_8^b = \frac{2}{3}(1 + \log_2^3) = \frac{2}{3}(\log_2^2 + \log_2^3) = \log_8^{36} \Rightarrow b = 36$$

$(\log_2^6)$

$$\log(4b-8) = \log^{100} = 2$$

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$4ax^2 + bx + \frac{1}{2}c = 0$

$\frac{-a}{b} =$ حاصلجمع ریشه‌ها

$2a = b + c$

$\frac{4a}{b} = \log^4 \qquad \frac{2a}{b} = \log^2$

$2a = \log^2 \times b$

$$\left(\frac{1}{\sqrt{2}}\right)^{\frac{c}{a}}$$

$$(2)^{-\frac{c}{8a}} = 2^{-\frac{2a-b}{8a}}$$

$$(2)^{-\frac{\log^2 b - b}{4b\log^2}} = (2)^{\frac{b(1-\log^2)}{4b\log^2}} = (2)^{\frac{1}{4}\left(\frac{\log^5}{\log^2}\right)} \quad (2)^{\frac{1}{4}\log_2^5}$$

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