SISTEMATIZACIJA LOGARITAMA

Domaći zadatak: Mina Raonić II-h

Zadatak: pridruži rešenje zadatka naznačenom slovu, a potom obojaj odgovarajuće polje u tabeli.

Primjer: A: $\log_3 3=1$→ obojaj polje A1

ZADACI

B: $\log_3 27$ 1 bod

J: log400+log250 3 boda

F: $\log_2 256$ 1 bod

G: Rješenje jednačine $\log_x 27 = 3$ 1 bod

F: $3^{1+\log_3 2}$ 3 boda

K: $5^{-3\log_5 \frac{1}{2}}$ 3 boda

L: $\ln e + 3$ 2 boda

B: $9^{\log_3 \sqrt{7}}$ 3 boda

B: $\left(ln\sqrt[4]{e}\right)^{-1}$ 3 boda

F: $\sqrt{\log_2 16}\cdot\frac{5}{2}$ 3 boda

F: $16^{\log_4 \sqrt{7}}$ 3 boda

B: $\left(\log_{11}\left(1+3^{\log_3 120}\right)\right)\cdot 4$ 3 boda

F: Rješenje jednačine $\log_2 x + \log_x 2 = \frac{5}{2}, \quad x \in \mathbb{Z}$ 3 boda

L: $\log_2 32$ 1 bod

J: $(\log_{16} 2)^{-1} + \left(\log_4 63 + \log_{\frac{1}{4}} 63\right)$ 4 boda

K: $\left(\left(\frac{1}{3}\right)^{1+\log_{\frac{1}{3}} 2}\right)^{-1}\cdot\log_2 4$ 5 bodova

K: $5^{1-\log_5 2}\cdot\log_9 81$ 3 boda

Zanimljivost: Logaritme su nezavisno razvila dva naučnika: Napier i Burgi

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L: $15 \cdot \left(\log_{\frac{1}{7}}\left(7^{\frac{1}{5}} \cdot \frac{1}{49} \cdot 5^{\log_{\sqrt{5}} \sqrt[3]{49}}\right)\right)$ 7 bodova

L:Rješenje jednačine

$\log_3 \sqrt{x-5} + \log_3 \sqrt{2x-3} = 1$ 5 bodova

B: $5(\log_5(\log_3 27 + \log_3 9))$ 4 boda

D: Rješenje jednačine

$\log_2(8+x) + \log_2(x-6) = 5$ 3 boda

B: Rješenje jednačine

$\log x + \log(x-1) = \log(3x+12)$ 4 boda

H: $\ln e^3 + (\log_2 723 \cdot \log_2 1)$ 2 boda

H: $7^{\log_7 8} - \log_3 3 + \log_6 6$ 2 boda

C: $f(27) =$? ako je $f(x) = -1 + \log_{\sqrt[3]{3}} x$ 4 boda

H:Rješenje jednačine

$\log(x^2 - 5x - 5) = 0\ , x \in (-1, 12)$ 3 boda

H: $\ln e^7 + (\log 75 \cdot \log 1) + \ln e$ 4 boda

G: $\log_{16}^{-3}(log_3 81)$ 4 boda

L: $\log_2 768 - \log_2 3 + \log_2 54 \cdot \log_{452} 1$ 3 boda

H: $\log_5 25 + (\log_3 108 - \log_3 4)$ 2 boda

F: $2\log_6 2 + \log_6 9 + (\log_3 9 - \log_3 3)$ 3 boda

J: $4 \cdot \log_x \sqrt[4]{x^3}$ 3 boda

L: $\frac{\left(\log_3 \frac{1}{27}\right)^4}{27}$ 2 boda

Zanimljivost: Vrijednost nivoa u decibelima izračunava se kao desetostruki logaritam za osnovu 10 količnika snage prema referentnoj snazi

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Bodovna lista:

0-40 (1)

41- 67 (2)

68-75 (3)

76-88 (4)

89-100 (5)

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RJEŠENJA ZADATAKA

B: $\log_3 27 = 3$

J: log400+log250 = 5

F: $\log_2 256 = 8$

G: $\log_x 27 = 3 \Rightarrow x = 3$

F: $3^{1+\log_3 2} = 3 \cdot 3^{\log_3 2} = 6$

K: $5^{-3\log_5 \frac{1}{2}} = 5^{\log_5 8} = 8$

L: $\ln e + 3 = 4$

B: $9^{\log_3 \sqrt{7}} = 3^{2\log_3 \sqrt{7}} = 3^{\log_3 7} = 7$

B: $\left(ln\sqrt[4]{e}\right)^{-1} = \frac{1}{ln e^{\frac{1}{4}}} = 4$

F: $\sqrt{\log_2 16} \cdot \frac{5}{2} = 2 \cdot \frac{5}{2} = 5$

F: $16^{\log_4 \sqrt{7}} = 4^{2\log_4 \sqrt{7}} = 4^{\log_4 7} = 7$

B: $\left(\log_{11}\left(1 + 3^{\log_3 120}\right)\right) \cdot 4 = (\log_{11} 121) \cdot 4 = 8$

F: $\log_2 x + \log_x 2 = \frac{5}{2}, \quad x \in \mathbb{Z} \quad , \quad x > 0, \ x \neq 1$

$\log_2 x + \frac{1}{\log_2 x} = \frac{5}{2}$ smjena: $\log_2 x = t$

$t + \frac{1}{t} = \frac{5}{2}$

$2t^2 - 5t + 2 = 0 \qquad t_1 = 2, \quad t_2 = \frac{1}{2} \Longrightarrow x = 4 \vee x = \cancel{\sqrt{2}}$

L: $\log_2 32 = 5$

J: $(\log_{16} 2)^{-1} + \left(\log_4 63 + \log_{\frac{1}{4}} 63\right) = \left(\frac{1}{4}\right)^{-1} + (\log_4 63 - \log_4 63) = 4$

K: $\left(\left(\frac{1}{3}\right)^{1+\log_{\frac{1}{3}} 2}\right)^{-1} \cdot \log_2 4 = \left(\frac{1}{3} \cdot 2\right)^{-1} \cdot 2 = \frac{3}{2} \cdot 2 = 3$

K: $5^{1-\log_5 2} \cdot \log_9 81 = 5 \cdot \frac{1}{2} \cdot 2 = 5$

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L: $15 \cdot \left(\log_{\frac{1}{7}}\left(7^{\frac{1}{5}} \cdot \frac{1}{49} \cdot 5^{\log_{\sqrt{5}} \sqrt[3]{49}}\right)\right) = 15 \cdot \left(-\log_7\left(7^{\frac{1}{5}} \cdot 7^{-2} \cdot 5^{\log_5 \sqrt[3]{49^2}}\right)\right) =$

$$15 \cdot \left(-\log_7 7^{-\frac{9}{5}} \cdot 7^{\frac{4}{3}}\right) = 15 \cdot \left(-\log_7 7^{-\frac{7}{15}}\right) = 15 \cdot \frac{7}{15} = 7$$

L: $\log_3 \sqrt{x-5} + \log_3 \sqrt{2x-3} = 1 \; ; \quad D = (5, +\infty)$

$\log_3 \sqrt{(x-5)(2x-3)} = 1$

$\sqrt{(x-5)(2x-3)} = 3$

$(x-5)(2x-3) = 9$

$2x^2 - 13x + 6 = 0 \quad \Leftrightarrow x = 6 \vee \cancel{x = \frac{1}{2}}$

B: $5(\log_5(\log_3 27 + \log_3 9)) = 5 \log_5 \log_3 3^5 = 5 \log_5 5 = 5$

D: $\log_2(8+x) + \log_2(x-6) = 5 \qquad D = (6, +\infty)$

$\log_2(8+x)(x-6) = 5$

$(8+x)(x-6) = 32$

$x^2 + 2x - 80 = 0$

$x = 8, \quad \cancel{x = -10}$

B: $\log x + \log(x-1) = \log(3x+12) \qquad D = (1, +\infty)$

$\log x(x-1) = \log(3x+12)$

$x^2 - x = 3x + 12$

$x^2 - 4x - 12 = 0$

$x = 6 \qquad \cancel{x = -2}$

H: $\ln e^3 + (\log_2 723 \cdot \log_2 1) = 3lne + 0 = 3$

H: $7^{\log_7 8} - \log_3 3 + \log_6 6 = 8$

C: $f(27) = -1 + \log_{\sqrt[3]{3}} 27 = -1 + 9 = 8$

H: $\log(x^2 - 5x - 5) = 0$

$x^2 - 5x - 5 = 1$

$x^2 - 5x - 6 = 0$

$x = 6, \quad \cancel{x = -1}$

H: $\ln e^7 + (\log 75 \cdot \log_3 1) + \ln e = 7 + 1 = 8$

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G: $\log_{16}^{-3}(\log_3 81) = (\log_{16} 4)^{-3} = \left(\frac{1}{2}\right)^{-3} = 8$

L: $\log_2 768 - \log_2 3 + \log_2 54 \cdot \log_{452} 1 = \log_2 256 + 0 = 8$

H: $\log_5 25 + (\log_3 108 - \log_3 4) = 2 + \log_3 27 = 5$

F: $2\log_6 2 + \log_6 9 + (\log_3 9 - \log_3 3) = \log_6 36 + \log_3 3 = 3$

J: $4 \cdot \log_x \sqrt[4]{x^3} = 4 \cdot \frac{3}{4} = 3$

L: $\frac{\left(\log_3 \frac{1}{27}\right)^4}{27} = \frac{(-3)^4}{27} = 3$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														