LOGARITMAREA UNOR EXPRESII

Fără a folosi proprietăți ale puterilor, logaritmați în baza b

1) $E=\dfrac{x\cdot\sqrt[3]{y\cdot x^2}}{\sqrt[6]{x^3\cdot\sqrt{y}}}$

2) $E=\sqrt[3]{\dfrac{x\cdot\sqrt{y}}{\sqrt[3]{x}\cdot\frac{1}{y^2}}}$

3) $E=\sqrt[5]{\dfrac{x\cdot y^{-3}\cdot\sqrt[5]{x}}{\sqrt[7]{y}\cdot\frac{1}{x^5}}}$

4) $E=\sqrt[7]{\dfrac{x\cdot y^7\cdot\sqrt{x}}{\sqrt[3]{y}\cdot x^{-2}\cdot\sqrt{y}}}$

5) $E=\dfrac{\sqrt[3]{x^7\cdot y^{-3}}}{\sqrt[5]{\sqrt{x}\cdot\sqrt[7]{y}}}$

6) $E=\dfrac{\sqrt[8]{\sqrt{x^3}\cdot\sqrt[5]{y^7}}}{\sqrt[5]{\sqrt[3]{x^2}\cdot\sqrt[5]{y}}}$

7) $E=\dfrac{\sqrt[7]{\sqrt{y^5}\cdot\sqrt[3]{x^2}}}{x\cdot y^{-5}\cdot\sqrt[5]{y^3}}$

8) $E=\sqrt[8]{\sqrt{x}\cdot\sqrt[3]{y^5}\cdot\sqrt[4]{y}\cdot\sqrt{x^3y}}$

9) $E=\sqrt{\sqrt[8]{x}\cdot\sqrt{y}\cdot y^{-\frac{1}{3}}}$

10) $E=x\cdot\sqrt[8]{y^3\cdot\sqrt{x}\cdot\sqrt[3]{y}}\cdot\sqrt[5]{x^2}$

11) $E=\dfrac{\sqrt[3]{x\cdot\sqrt{y^2\cdot x}}}{x^3\cdot\sqrt[4]{x\cdot\sqrt[5]{y}}}$

12) $E=\dfrac{x^3\cdot\sqrt[3]{y}\cdot\sqrt{xy^2}}{\sqrt[4]{xy^{-1}}}$

Prof. Ovidiu Bădescu

Logaritmați expresia

$$E = \frac{x \cdot \sqrt{y \cdot x^2}}{\sqrt[6]{x^3 \cdot \sqrt{y}}}$$

$E_1)\ \log_b E = \log_b \frac{x \cdot \sqrt{y \cdot x^2}}{\sqrt[6]{x^3 \cdot \sqrt{y}}} =$

$= \log_b \left(x \cdot \sqrt{y \cdot x^2}\right) - \log_b \left(\sqrt[6]{x^3 \cdot \sqrt{y}}\right) =$

$= \left(\log_b x + \log_b \sqrt{y \cdot x^2}\right) - \frac{1}{6} \log_b \left(x \cdot \sqrt{y}\right) =$

$= \log_b x + \frac{1}{3} \log_b (y \cdot x^2) - \frac{1}{6} \left(\log_b x^3 + \log_b \sqrt{y}\right) =$

$= \log_b x + \frac{1}{3} \left(\log_b y + \log_b x^2\right) - \frac{1}{6} \left(3 \log_b x + \frac{1}{2} \log_b y\right) =$

$= \log_b x + \frac{1}{3} \log_b y + \frac{2}{3} \log_b x - \frac{1}{2} \log_b x - \frac{1}{12} \log_b y$

$E_2)\ \log_b E = \left(\frac{6}{1} + \frac{2}{3} - \frac{3}{1}\right) \log_b x + \left(\frac{1}{3} - \frac{1}{12}\right) \log_b y$

$\log_b E = \frac{7}{6} \log_b x + \frac{3}{12} \log_b y$

$\log_b E = \frac{7}{6} \log_b x + \frac{1}{4} \log_b y$

Prof. Ovidiu Bădescu

Logaritmați în baza b

$$E=\sqrt[3]{\frac{x\cdot\sqrt{y}}{\sqrt[3]{x}\cdot\frac{1}{y^2}}}$$

$E_1)\ \log_b E=\log_b\sqrt[3]{\frac{x\cdot\sqrt{y}}{\sqrt[3]{x}\cdot\frac{1}{y^2}}}=\frac{1}{3}\log_b\frac{x\cdot\sqrt{y}}{\sqrt[3]{x}\cdot\frac{1}{y^2}}=$

$=\frac{1}{3}\left(\log_b(x\cdot\sqrt{y})-\log_b\left(\sqrt[3]{x}\cdot\frac{1}{y^2}\right)\right)=$

$=\frac{1}{3}\left(\left(\log_b x+\log_b\sqrt{y}\right)-\left(\log_b\sqrt[3]{x}+\log_b\frac{1}{y^2}\right)\right)=$

$=\frac{1}{3}\left(\left(\log_b x+\frac{1}{2}\log_b y\right)-\left(\frac{1}{3}\log_b x+(-2)\log_b y\right)\right)=$

$=\frac{1}{3}\left(\log_b x+\frac{1}{2}\log_b y-\frac{1}{3}\log_b x+2\log_b y\right)$

$=\frac{1}{3}\left(\left(\frac{3-1}{3}\right)\log_b x+\left(\frac{1}{2}+\frac{2}{2}\right)\log_b y\right)$

$=\frac{1}{3}\left(\frac{2}{3}\log_b x+\frac{5}{2}\log_b y\right)=$

$=\frac{2}{9}\log_b x+\frac{5}{6}\log_b y$

Prof. Ovidiu Lapusan

Logaritmați în baza b expresia

$$E=\sqrt[5]{\frac{x\cdot y^{-3}\sqrt[5]{x}}{\sqrt[7]{y}\cdot\frac{1}{x^5}}}$$

fără a folosi proprietățile puterilor

$E_1)\ \log_b E=\log_b\sqrt[5]{\frac{x\cdot y^{-3}\sqrt[5]{x}}{\sqrt[7]{y}\cdot\frac{1}{x^5}}}=\frac{1}{5}\log_b\frac{xy^{-3}\cdot\sqrt[5]{x}}{\sqrt[7]{y}\cdot\frac{1}{x^5}}=$

$=\frac{1}{5}\left(\log_b\left(x\cdot y^{-3}\cdot\sqrt[5]{x}\right)-\log_b\left(\sqrt[7]{y}\cdot\frac{1}{x^5}\right)\right)=$

$=\frac{1}{5}\left(\left(\log_b x+\log_b y^{-3}+\log_b\sqrt[5]{x}\right)-\left(\log_b\sqrt[7]{y}+\log_b\frac{1}{x^5}\right)\right)=$

$=\frac{1}{5}\left(\left(\log_b x-3\log_b y+\frac{1}{5}\log_b x\right)-\left(\frac{1}{7}\log_b y+\underbrace{\log_b 1}_{0}-\log_b x^5\right)\right)$

$=\frac{1}{5}\left(\log_b x-3\log_b y+\frac{1}{5}\log_b x-\frac{1}{7}\log_b y+5\log_b x\right)$

$E_2)\ \log_b E=\frac{1}{5}\left[\left(1+\frac{1}{5}+5\right)\log_b x+\left(-3-\frac{1}{7}\right)\log_b y\right]$

$\log_b E=\frac{1}{5}\left(\frac{31}{5}\log_b x-\frac{22}{7}\log_b y\right)$

$\log_b E=\frac{31}{25}\log_b x-\frac{22}{35}\log_b y$

Prof. Ovidiu Bădescu

Fără a folosi prop. ale puterilor, logaritmați

$$E = \sqrt[7]{\frac{x \cdot y^7 \cdot \sqrt{x}}{\sqrt[3]{y} \cdot x^{-2} \cdot \sqrt{y}}}$$

E1) $\log_b E = \log_b \sqrt[7]{\frac{x y^7 \cdot \sqrt{x}}{\sqrt[3]{y} \cdot x^{-2} \cdot \sqrt{y}}} =$

$= \frac{1}{7} \log_b \frac{x y^7 \cdot \sqrt{x}}{\sqrt[3]{y} \cdot x^{-2} \cdot \sqrt{y}} =$

$= \frac{1}{7} \left(\log_b (x y^7 \cdot \sqrt{x}) - \log_b (\sqrt[3]{y} \cdot x^{-2} \cdot \sqrt{y}) \right) =$

$= \frac{1}{7} \left((\log_b x + \log_b y^7 + \log_b \sqrt{x}) - (\log_b \sqrt[3]{y} + \log_b x^{-2} + \log_b \sqrt{y}) \right) =$

$= \frac{1}{7} \left((\log_b x + 7 \log_b y + \frac{1}{2} \log_b x) - (\frac{1}{3} \log_b y - 2 \log_b x + \frac{1}{2} \log_b y) \right) =$

$= \frac{1}{7} \left((1 + \frac{1}{2} + 2) \log_b x + (7 - \frac{1}{3} - \frac{1}{2}) \log_b y \right) =$

$= \frac{1}{7} \left(\frac{7}{2} \log_b x + \frac{37}{6} \log_b y \right) =$

$= \frac{1}{2} \log_b x + \frac{37}{42} \log_b y$

Prof. Ovidiu Badescu

Logaritmați în baza b expresia

$$E=\frac{\sqrt[3]{x^7\cdot y^{-3}}}{\sqrt[5]{\sqrt{x}\cdot\sqrt[7]{y}}}$$

$E_1)\ \log_b E=\log_b \frac{\sqrt[3]{x^7\cdot y^{-3}}}{\sqrt[5]{\sqrt{x}\cdot\sqrt[7]{y}}}=\log_b\sqrt[3]{x^7\cdot y^{-3}}-\log_b\sqrt[5]{\sqrt{x}\cdot\sqrt[7]{y}}$

$=\frac{1}{3}\log_b(x^7\cdot y^{-3})-\frac{1}{5}\log_b(\sqrt{x}\cdot\sqrt[7]{y})=$

$=\frac{1}{3}(\log_b x^7+\log_b y^{-3})-\frac{1}{5}(\log_b\sqrt{x}+\log_b\sqrt[7]{y})=$

$=\frac{1}{3}(7\log_b x-3\log_b y)-\frac{1}{5}(\frac{1}{2}\log_b x+\frac{1}{7}\log_b y)=$

$=\frac{7}{3}\log_b x-\log_b y-\frac{1}{10}\log_b x-\frac{1}{35}\log_b y=$

$=\left(\frac{7}{3}-\frac{1}{10}\right)\log_b x+\left(-1-\frac{1}{35}\right)\log_b y=$

$=\frac{67}{30}\log_b x-\frac{36}{35}\log_b y$

Logaritmați în baza b

$$E = \frac{\sqrt[8]{\sqrt{x^3} \cdot \sqrt[5]{y^7}}}{\sqrt[5]{\sqrt[3]{x^2} \cdot \sqrt[5]{y}}}$$

$E_1)$ mod I $E = \dfrac{\sqrt[8]{x^{\frac{3}{2}} \cdot y^{\frac{7}{5}}}}{\sqrt[5]{x^{\frac{2}{3}} \cdot y^{\frac{1}{5}}}} = \dfrac{\left(x^{\frac{3}{2}} \cdot y^{\frac{7}{5}}\right)^{\frac{1}{8}}}{x^{\frac{2}{15}} \cdot y^{\frac{1}{25}}} =$

$= \dfrac{x^{\frac{3}{16}} \cdot y^{\frac{7}{40}}}{x^{\frac{2}{15}} \cdot y^{\frac{1}{25}}} = x^{\frac{5}{16}-\frac{2}{15}} \cdot y^{\frac{7}{40}-\frac{1}{25}}$

$= x \cdot y$

$= x$

$E_2) \log_b E = \log_b (x \cdot y) =$

$= \log_b x + \log_b y$

Prof. Ovidiu Bădescu

Logaritmați expresia:

$$E = \frac{\sqrt[3]{x \cdot \sqrt{y^2 \cdot x}}}{x^3 \cdot \sqrt[4]{x \cdot \sqrt[5]{y}}}$$

Prof. Ovidiu Bădescu

Logaritmați expresia

$$E = \frac{x^3 \cdot \sqrt[3]{y} \cdot \sqrt{xy^2}}{\sqrt[4]{xy^{-1}}}$$

E1.) $\log_b E = \log_b \frac{x^3 \cdot \sqrt[3]{y} \cdot \sqrt{xy^2}}{\sqrt[4]{xy^{-1}}} =$

$= \log_b (x^3 \cdot \sqrt[3]{y} \cdot \sqrt{xy^2}) - \log_b \sqrt[4]{xy^{-1}}$

$= \log_b x^3 + \log_b \sqrt[3]{y} + \log_b \sqrt{xy^2} - \frac{1}{4} \log_b (xy^{-1}) =$

$= 3\log_b x + \frac{1}{3}\log_b y + \frac{1}{2}\log_b (xy^2) - \frac{1}{4}(\log_b x + \log_b y^{-1}) =$

$= 3\log_b x + \frac{1}{3}\log_b y + \frac{1}{2}(\log_b x + 2\log_b y) - \frac{1}{4}(\log_b x - \log_b y) =$

$= 3\log_b x + \frac{1}{3}\log_b y + \frac{1}{2}\log_b x + \log_b y - \frac{1}{4}\log_b x + \frac{1}{4}\log_b y =$

$= (\log_b x)\left(3 + \frac{1}{2} - \frac{1}{4}\right) + (\log_b y)\left(\frac{1}{3} + 1 + \frac{1}{4}\right) =$

$= \frac{13}{4}\log_b x + \frac{19}{12}\log_b y$

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