Hatványozás azonosságok

Elnevezés	Azonosság	Példák	
E1	$a^n \cdot a^m = a^{n+m}$	$2^3 \cdot 2^5 = 2^{3+5} = 2^8$ $x^4 \cdot x^7 = 2^{4+7} = x^{11}$	$2^{x+2} = 2^x \cdot 2^2$ $x^{y+4} = x^y \cdot x^4$
E2	$\frac{a^n}{a^m} = a^{n-m}$	$\frac{2^7}{2^2} = 2^{7-2} = 2^5$ $\frac{x^2}{x^4} = 2^{2-4} = x^{-2}$	$2^{x-3} = \frac{2^x}{2^3}$ $x^{y-5} = \frac{x^y}{x^5}$
E3	$a^n \cdot b^n = (a \cdot b)^n$	$2^x \cdot 3^x = (2 \cdot 3)^x = 6^x$ $x^2 \cdot y^2 = (x \cdot y)^2$	$10^x = (2 \cdot 5)^x = 2^x \cdot 5^x$ $(x \cdot y)^4 = x^4 \cdot y^4$
E4	$\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$	$\frac{3^x}{5^x} = \left(\frac{3}{5}\right)^x$ $\frac{x^5}{y^5} = \left(\frac{x}{y}\right)^5$	$\left(\frac{7}{8}\right)^x = \frac{7^x}{8^x}$ $\left(\frac{x}{y}\right)^3 = \frac{x^3}{y^3}$
E5	$(a^n)^m = (a^m)^n = a^{n \cdot m}$	$(3^2)^5 = 3^{2 \cdot 5} = 3^{10}$ $(x^3)^4 = x^{3 \cdot 4} = x^{12}$ $(4^7)^9 = (4^9)^7$	$5^{2 \cdot 4} = (5^2)^4$ $x^{7 \cdot 5} = (x^7)^5$ $(x^3)^8 = (x^8)^3$
E6	$a^1 = a$	$2^1 = 2$ $x^1 = x$	$5 = 5^1$ $y = y^1$
E7	$a^0 = 1$	$3^0 = 1$ $x^0 = 1$	$1 = 6^0$ $1 = x^0$
E8	$a^{-1} = \frac{1}{a}$	$2^{-1} = \frac{1}{2}$ $x^{-1} = \frac{1}{x}$	$\frac{1}{3} = 3^{-1}$ $\frac{1}{y} = y^{-1}$
E9	$a^{-n} = \frac{1}{a^n}$	$4^{-2} = \frac{1}{4^2} = \frac{1}{16}$ $x^{-12} = \frac{1}{x^{12}}$	$\frac{1}{5^4} = 5^{-4}$ $\frac{1}{y^5} = y^{-5}$

Logaritmus azonosságok

Elnevezés	Azonosság	Példák
L1	$\log_a b = c \to a^c = b$	$\log_2 x = 5 \to 2^5 = x$ $\log_3 27 = x \to 3^x = 27$ $\log_x 16 = 4 \to x^4 = 16$
L2	$\log_{10} x = \lg x = \log x$	-
L3	$\log_e x = \ln x$	-
L4	$\log_a (x \cdot y) = \log_a x + \log_a y$	$\log_3 (2 \cdot x) = \log_3 2 + \log_3 x$ $\log_5 7 + \log_5 y = \log_5 (7 \cdot y)$
L5	$\log_a \left(\frac{x}{y}\right) = \log_a x - \log_a y$	$\log_8 \left(\frac{3}{10}\right) = \log_8 3 - \log_8 10$ $\log_4 2 - \log_4 8 = \log_4 \left(\frac{2}{8}\right)$
L6	$\log_a x^n = n \cdot \log_a x$	$\log_5 x^3 = 3 \cdot \log_5 x$ $4 \cdot \log_3 x = \log_3 x^4$
L7	$\log_a \sqrt[n]{x} = \frac{1}{n} \cdot \log_a x$	$\log_9 \sqrt[5]{3} = \frac{1}{5} \cdot \log_9 3$ $\frac{1}{3} \cdot \log_2 8 = \log_2 \sqrt[3]{8}$
L8	$\log_a a = 1$	$\log_2 2 = 1$ $\quad 1 = \log_5 5$ $\log_x x = 1$ $\quad 1 = \log_y y$
L9	$\log_a 1 = 0$	$\log_2 1 = 0$ $\quad 0 = \log_5 1$ $\log_x 1 = 0$ $\quad 0 = \log_x 1$
L10	$\log_a x = \frac{\log_b x}{\log_b a}$	$\log_5 8 = \frac{\log_{10} 8}{\log_{10} 5}$
L11	$b = \log_a a^b$	$2 = \log_3 3^2$
L12	$a^{\log_b c} = c^{\log_b a}$	$2^{\log_4 x} = x^{\log_4 2}$

Gyökvonás azonosságok

Elnevezés	Azonosság	Példák
GY1	$\sqrt{a}\cdot\sqrt{b}=\sqrt{a\cdot b}$	$\sqrt{2}\cdot\sqrt{3}=\sqrt{2\cdot 3}=\sqrt{6}$ $\sqrt{5\cdot x}=\sqrt{5}\cdot\sqrt{x}$
GY2	$\frac{\sqrt{a}}{\sqrt{b}}=\sqrt{\frac{a}{b}}$	$\frac{\sqrt{x}}{\sqrt{7}}=\sqrt{\frac{x}{7}}$ $\frac{\sqrt{16}}{\sqrt{4}}=\sqrt{\frac{16}{4}}=\sqrt{4}=2$
GY3	$\sqrt[n]{a}\cdot\sqrt[n]{b}=\sqrt[n]{a\cdot b}$	$\sqrt[4]{8}\cdot\sqrt[4]{x}=\sqrt[4]{8\cdot x}$ $\sqrt[8]{2\cdot 9}=\sqrt[8]{2}\cdot\sqrt[8]{9}$
GY4	$\frac{\sqrt[n]{a}}{\sqrt[n]{b}}=\sqrt[n]{\frac{a}{b}}$	$\frac{\sqrt[3]{5}}{\sqrt[3]{4}}=\sqrt[3]{\frac{5}{4}}$ $\frac{\sqrt[7]{1}}{\sqrt[7]{x}}=\sqrt[7]{\frac{1}{x}}$
GY5	$\sqrt[n]{a}=a^{\frac{1}{n}}$	$\sqrt[5]{2}=2^{\frac{1}{5}}$ $10^{\frac{1}{4}}=\sqrt[4]{10}$ $\sqrt[3]{x}=x^{\frac{1}{3}}$ $x^{\frac{1}{9}}=\sqrt[9]{x}$
GY6	$\sqrt[n]{a^m}=a^{\frac{m}{n}}$	$\sqrt[7]{2^2}=2^{\frac{2}{7}}$ $3^{\frac{5}{4}}=\sqrt[4]{3^5}$ $\sqrt[3]{x^5}=x^{\frac{5}{3}}$ $x^{\frac{10}{7}}=\sqrt[\text{ű}]{x^{10}}$
GY7	$\sqrt[n]{a^m}=\left(\sqrt[n]{a}\right)^m$	$\sqrt[3]{8^6}=\left(\sqrt[3]{8}\right)^6$
GY8	$\sqrt[n]{a}\cdot\sqrt[m]{a}=\sqrt[n\cdot m]{a^{n+m}}$	$\sqrt[2]{x}\cdot\sqrt[3]{x}=\sqrt[2\cdot 3]{x^{2+3}}=\sqrt[6]{x^5}$
GY9	$\frac{\sqrt[n]{a}}{\sqrt[m]{a}}=\sqrt[n\cdot m]{a^{m-n}}$	$\frac{\sqrt[3]{x}}{\sqrt[7]{x}}=\sqrt[7\cdot 3]{x^{7-3}}=\sqrt[21]{x^4}$