

**Mathematics**

**Laws of Exponents**

**Instructor : Cahya Rahmad, ST., M.Kom., Dr.Eng**

|  |  |  |
| --- | --- | --- |
| **06** | **Davis Maulana Hermanto** | **2241720255** |
| **27** | **Susila Fajar Bahiy ‘Aqil** | **2241720245** |

**STATE POLYTECHNIC OF MALANG**

**Soekarno Hatta St. No. 9, Jatimulyo, Lowokwaru Sub-District,**

**Malang Ciity, East Java 65141**

**Phone (0341) 404424**

**E-mail :** [**cs@polinema.ac.id**](mailto:cs@polinema.ac.id)

**2022**

Laws of exponents

### **What are exponents?**

The exponents, also called powers, define how many times we have to multiply the base number. For example, the number 2 has to be multiplied 3 times and is represented by 23.

In Mathematics, there are different laws of exponents. All the rules of exponents are used to solve many mathematical problems which involve repeated multiplication processes. The laws of exponents simplify the multiplication and division operations and help to solve the problems easily. In this article, we are going to discuss the six important laws of exponents with many solved examples.

Exponents are used to show repeated multiplication of a number by itself. For example, 7 × 7 × 7 can be represented as 73. Here, the exponent is ‘3’ which stands for the number of times the number 7 is multiplied. 7 is the base here which is the actual number that is getting multiplied. So basically [**exponents or powers**](https://byjus.com/maths/exponents-powers/) denotes the number of times a number can be multiplied. If the power is 2, that means the base number is multiplied two times with itself. Some of the examples are:

* 34 = 3×3×3×3
* 105 = 10×10×10×10×10
* 163 = 16 × 16 × 16

Suppose, a number ‘a’ is multiplied by itself n-times, then it is represented as an where a is the base and n is the exponent.

laws of exponents

Exponents follow certain rules that help in simplifying expressions which are also called its laws. Let us discuss the laws of exponents in detail.

***The Laws of Exponents:***

**#1: Exponential form: *The exponent of a power indicates***

***how many times the base multiplies itself.***



n factors of x



**#2: Multiplying Powers:  *If you are multiplying Powers with the same base, KEEP the BASE & ADD the EXPONENTS!***





**#3: Dividing Powers: *When dividing Powers with the same base, KEEP the BASE & SUBTRACT the EXPONENTS!***





**#4: Power of a Power: *If you are raising a Power to an exponent, you multiply the exponents!***





**#5: Product Law of Exponents: *If the product of the bases is powered by the same exponent, then the result is a multiplication of individual factors of the product, each powered by the given exponent.***





**#6: Quotient Law of Exponents: *If the quotient of the bases is powered by the same exponent, then the result is both numerator and denominator , each powered by the given exponent.***





**#7: Negative Law of Exponents: *If the base is powered by the negative exponent, then the base becomes reciprocal with the*** ***positive exponent.***





**#8: Zero Law of Exponents: *Any base powered by zero exponent equals one.***





TRY THESE :

