Arkalyk state pedagogical Institute named after Y. Altynsarin

Theme:
Power

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" People unfamiliar with algebra can not imagine the wonderful things that can be achieved with the help of ... called science."

G.W Leibniz

*Determination of a natural indicator

Powers of a with natural exponent n is the product of n factors, each of which is equal to a.

$$a^n = \underbrace{a \cdot a \cdot \ldots \cdot a}_{n \text{ раз}}$$

* **Properties with a natural indicator of the degree of**

$$a^m \cdot a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(ab)^n = a^n b^n$$

$$(a^m)^n = a^{mn}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

equal to zero, with

* **Determination of the zero indicator**

$$a^0 = 1$$

* Multiplying powers with the same bases

For any number a and any positive integers m and n

$$a^m \cdot a^n = a^{m+n}$$

$$a^m \cdot a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(ab)^n = a^n b^n$$

Multiplying powers with the same bases of the base is left unchanged , and the figures add up

* The division of powers with the same bases

For any arbitrary natural number $a \neq 0$ and m and n, such that m> n

$$a^m \div a^n = a^{m-n}$$

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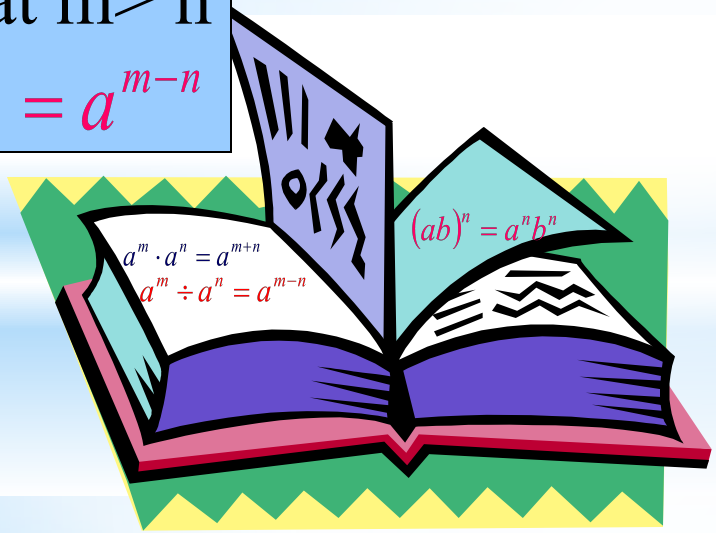

When dividing powers with the same base bases are left unchanged , and the dividend is subtracted from the index index divider

*Exponentiation works

For any numbers a and b and any positive integer n

$$(ab)^n = a^n b^n$$

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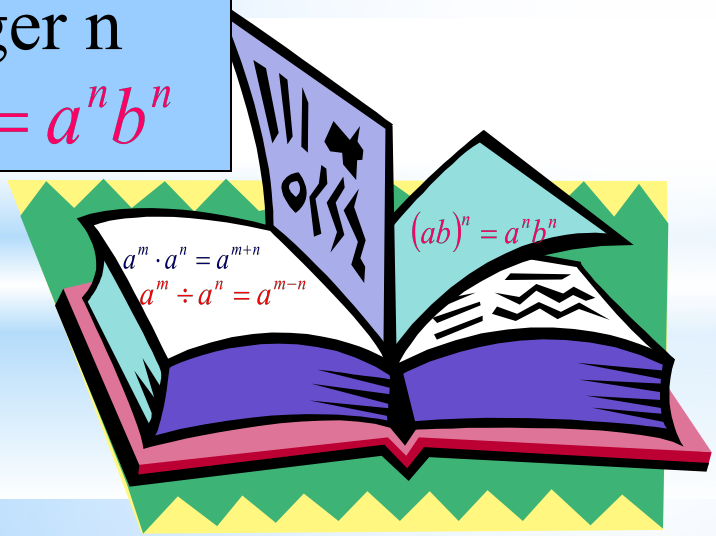

With the construction of the power works erected in the degree of each factor and multiply the results

*Exponentiation degree

For any number and a random natural numbers m and n

$$(a^m)^n = a^{mn}$$

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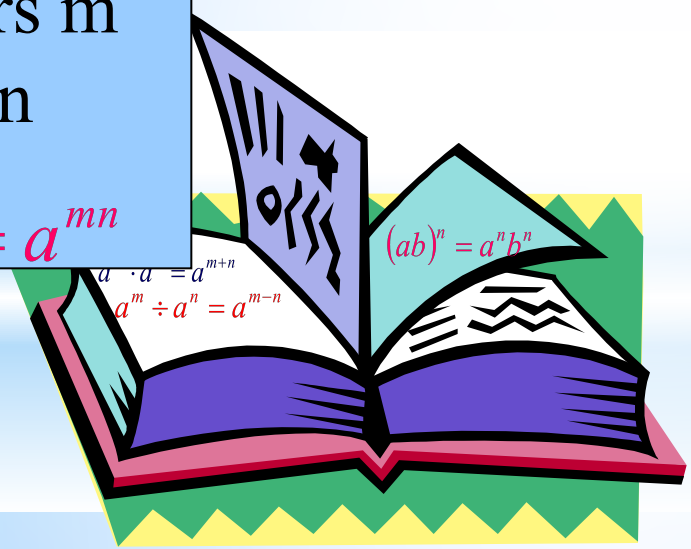


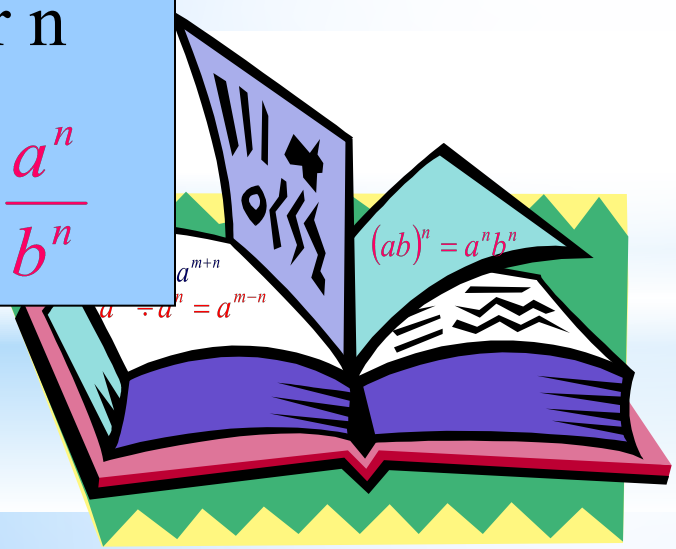
With the construction of the degree of the power base is left unchanged , and the figures are multiplied

*Exponentiation fraction

For any numbers a and b >0 and any positive integer n

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$



With the construction of the power fraction erected in the degree of the numerator and denominator of the fraction

History of the number of degree

In his famous book " Arithmetic " Diophantus of Alexandria described the first natural degree

Rene Descartes in his "geometry" (1637) , we find the current designation of degrees $a^2, a^3, \ldots$

* " Silences " Game

1. Follow these steps:

$x^{11} \cdot x \cdot x^2$; $x^{14} : x^5$; $(a^4)^3$; $(-3a)^2$.

2. Compare the expression to zero :

$(-5)^7$; $(-6)^{18}$; $(-4)^{11} \cdot (-4)^8$ $(-5)^{18} \cdot (-5)^6$; $-(-4)^8$.

3. Calculate the value of the expression :

$-1 \cdot 3^2$; $(-1 \cdot 3)^2$ $1 \cdot (-3)^2$; $-(2 \cdot 3)^2$; $1^2 \cdot (-3)^2$

THE GAME " THE PAIR OF NUMBERS "

1) $2xy \cdot 3x^2y^5$	1) $-5x^4y^5$
2) $3xy^3 \cdot x^3y^6$	2) $-x^5y^{10}z^3$
3) $-0,6ac^3 \cdot (-8)a^2c^4$	3) $6a^3c^5$
4) $-5a^2c \cdot 2ac \cdot (-0,6c^3)$	4) $6x^3y^6$
5) $xy^3z^3\ x \cdot x^3y^7$	5) $-9x^4y^6z^2$
	6) $4,8a^3c^7$
	7) $2x^4y^9$

Answers

* ANSWERS :

(1, 4)

(2, 7)

(3, 6)

(4, 3)

(5, 2)

Computational pause

1) $c^3 \cdot c^5 =$

2) $c^8 : c^6 =$

3) $(c^4)^3 =$

4) $c^3 \cdot c^5 : c^6 =$

5) $c^{14} \cdot c^8 =$

6) $c^7 : c^5 =$

7) $(c^4)^3 \cdot c =$

8) $c^4 \cdot c^5 \cdot c^0 =$

9) $c^{16} : c^8 =$

10) $(c^5)^3 =$

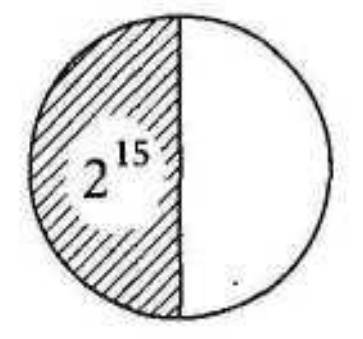
*Comparing expressions

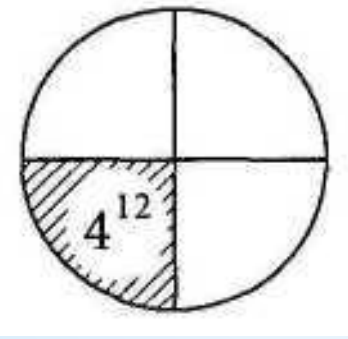
Compare without performing calculations. Find the correct inequalities. From their respective letters make up the name of the architect , the project is the building of the Bolshoi Theater in Moscow was built in 1825 :

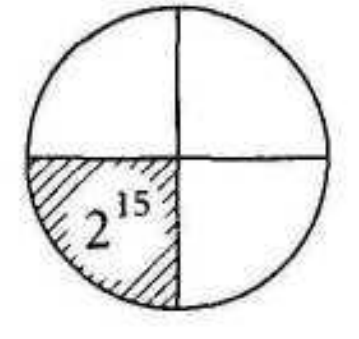
Я $(-15)^{10} < 0$	О $(-6,5)^4 > (-8,4)^3$
С $(-3,2)^{13} > 0$	В $(-3,4)^2 > -3,4^2$
Б $-4,1^{12} < 0$	Д $x^{101} \cdot x^{21} < 0$
М $-(-2)^{62} > 0$	Е $\frac{(-15)^4}{-15^4} < 0$

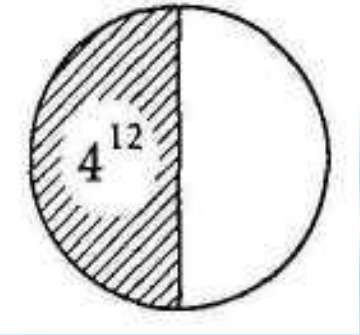
*What number illustrates a circle?

Find out how many shows a circle, if the shaded portion shows a specified number . A record in the form of a degree .









Reflection

I know	*I learned*	*I want to know*

THANK YOU FOR ATTENTION