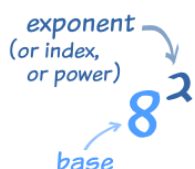


Introduction to Exponents

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What are Exponents?



An exponent is the continued product of a number multiplied with itself a number of times. It can be written as the number raised to the power of [natural number](#), equal to the number of times the number is multiplied with itself.

$$a^n = \underbrace{a \times a \times \dots \times a}_n$$

For example: 8×8 can be written as 8^2 and it is read as 8 raised to the power 2 or second

[power](#) of 8.

In 8^2 , we call 8 as the base and 2 as the [exponent](#) or power.

Types of Exponents

- Positive Exponents
- [Negative Exponents](#)
- [Fractional Exponents](#)
- [Zero Exponents](#)

Each type is discussed as follows:

Positive Exponents

Powers with [positive integer exponents](#) may be defined by the initial condition $a^1 = a$ and the recurrence relation $a^{n+1} = a \cdot a^n$

For example: 3^5 , here as we know that 3 is the base and 5 is the exponent which is positive.

Try this:

1. If $2^5 = 32$, then what would be $2^6 = ?$

(Answer: 64)

Negative Exponents

$a^{-n} = \frac{1}{a^n}$ A negative exponent is defined as the [reciprocal](#) of that power with a positive exponent.
 a^{-n} is the reciprocal of a^n .

For example: $2^{-3} =$

Try these questions now:

1. Express $(2)^{-4}$ with a positive exponent.
2. What is the value of 4^{-2} ?

Fractional Exponents

A fractional exponent is defined as an exponent of the form $1/n$, means to take the n th root instead of multiplying or dividing. For example, $4^{1/3}$ is the 3rd root([cube root](#)) of 4.

For example: What is $9^{1/2}$?

$9^{1/2}$ is the square root of 9 which is 3.

? $9^{1/2} = 3$

Try these questions now:

1. Evaluate: $16^{1/4}$
(Answer: 2)
2. Evaluate: $128^{1/7}$
(Answer: 2)

Zero Exponents

For any number (a) not equal to 0, $a^0=1$ or any non-zero number raised to the [power zero](#) is equal to 1.

For example: $2^0 = 1$

Try these questions now:

1. What is 1000^0 ?
(Answer: 1)
2. Evaluate: $(200)^0 + (100)^0$
(Answer: 2)

Now try it yourself! Should you still need any help, [click here](#) to schedule live online session with e Tutor!

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Reference Links :

- http://en.wikipedia.org/wiki/Natural_number
- <http://en.wikipedia.org/wiki/Power>
- <http://www.purplemath.com/modules/exponent2.htm>
- <http://en.wikipedia.org/wiki/Exponentiation>
- <http://www.purplemath.com/modules/exponent5.htm>
- http://wiki.answers.com/Q/What_is_zero_exponent
- <http://www.youtube.com/watch?v=OGbL6QZW0Ls&feature=fvwrel>
- <http://en.wikipedia.org/wiki/Reciprocal>
- http://en.wikipedia.org/wiki/Cube_root

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