Introduction to Exponents

What are Exponents?
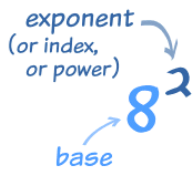
An exponent is the continued product of a number multiplied with itself a number of times. It can be written as the number raised to the power of a natural number, equal to the number of times the number is multiplied with itself.

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 an.

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 nth root instead of multiplying or dividing. For example, 41/3 is the 3rd root [(cube root)](#) of 4.

For example: What is 91/2?

91/2 is the square root of 9 which is 3.
? 91/2 = 3
Try these questions now:

1. Evaluate: 161/4
(Answer: 2)
2. Evaluate: 1281/7
(Answer: 2)

Zero Exponents

For any number (a) not equal to 0, a0=1 or any non-zero number raised to the [power zero](#) is equal to 1.

For example: 20 = 1

Try these questions now:

1. What is 1000?
(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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