

Exponents

By Monica Yuskaitis

Location of Exponent

- An exponent is a little number high and to the right of a regular or base number.

Base $\longrightarrow$ 3 4 $\longleftarrow$ Exponent

Definition of Exponent

- An exponent tells how many times a number is multiplied by itself.

Base $\longrightarrow$ 3 ⁴ $\longleftarrow$ Exponent

What an Exponent Represents

- An exponent tells how many times a number is multiplied by itself.

$$3^4 = 3 \times 3 \times 3 \times 3$$

How to read an Exponent

- This exponent is read *three to the fourth power*.

Base $\longrightarrow$ 3 4 $\longleftarrow$ Exponent

How to read an Exponent

- This exponent is read *three to the 2nd power* or *three squared*.

Base $\longrightarrow$ 3 2 $\longleftarrow$ Exponent

How to read an Exponent

- This exponent is read *three to the 3rd power* or *three cubed*.

Base $\longrightarrow$ 3 ³ $\longleftarrow$ Exponent

Read These Exponents

3^2 2^3 6^5 7^4

What is the Exponent?

$$2 \times 2 \times 2 = 2^{\textcolor{red}{3}}$$

What is the Exponent?

$$3 \times 3 = 3^{\underline{2}}$$

What is the Exponent?

$$5 \times 5 \times 5 \times 5 = 5^{\textcolor{red}{4}}$$

What is the Base and the Exponent?

$$8 \times 8 \times 8 \times 8 = \underline{8}^{\underline{4}}$$

What is the Base and the Exponent?

$$7 \times 7 \times 7 \times 7 \times 7 = \underline{7^5}$$

What is the Base and the Exponent?

$$9 \times 9 = \underline{9}^{\underline{2}}$$

How to Multiply Out an Exponent to Find the Standard Form

$$3^4 = 3 \times 3 \times 3 \times 3$$

The diagram illustrates the process of multiplying out the exponent 4 for the base 3. It shows the sequence of multiplications: $3 \times 3 = 9$, $9 \times 3 = 27$, and $27 \times 3 = 81$. The numbers are arranged in a descending staircase pattern, with diagonal lines connecting the intermediate results to the next step in the calculation.

What is the Base and Exponent
in Standard Form?

$$4^2 = \underline{16}$$

What is the Base and Exponent in Standard Form?

$$2^3 = \underline{8}$$

What is the Base and Exponent in Standard Form?

$$3^2 = \underline{9}$$

What is the Base and Exponent
in Standard Form?

$$5^3 = \underline{125}$$

Exponents Are Often Used in Area Problems to Show the Feet Are Squared

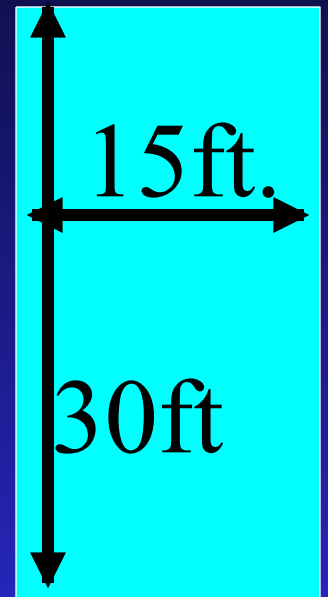
Length x width = area

A pool is a rectangle

Length = 30 ft.

Width = 15 ft.

Area = $30 \times 15 = 450 \text{ ft.}^2$



Exponents Are Often Used in Volume Problems to Show the Centimeters Are Cubed

Length x width x height = volume

A box is a rectangle

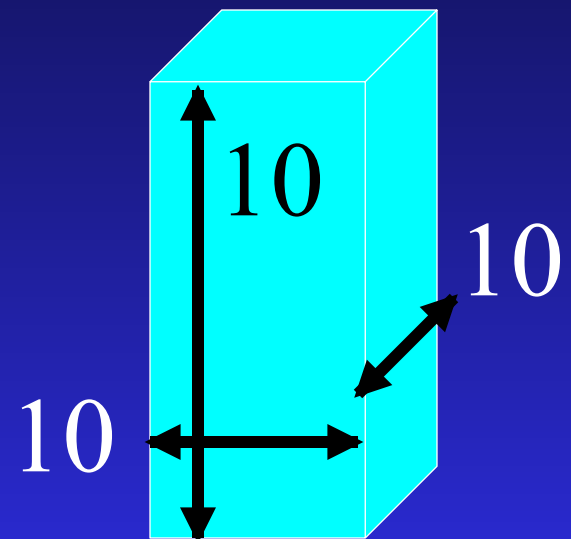
Length = 10 cm.

Width = 10 cm.

Height = 20 cm.

Volume =

$20 \times 10 \times 10 = 2,000 \text{ cm.}$



3

Here Are Some Areas Change Them to Exponents

$$40 \text{ feet squared} = 40 \text{ ft.}^2$$

$$56 \text{ sq. inches} = 56 \text{ in.}^2$$

$$38 \text{ m. squared} = 38 \text{ m.}^2$$

$$56 \text{ sq. cm.} = 56 \text{ cm.}^2$$

Here Are Some Volumes

Change Them to Exponents

$$30 \text{ feet cubed} = 30 \text{ ft.}^3$$

$$26 \text{ cu. inches} = 26 \text{ in.}^3$$

$$44 \text{ m. cubed} = 44 \text{ m.}^3$$

$$56 \text{ cu. cm.} = 56 \text{ cm.}^3$$