

19: Is $a \times a \times a = 3a$? Is $a^3 = a \times 3$

Or, should we *guess what a^3* is?

In mathematics, each symbol, (e.g. $a \times 3$, $3a$, a^3) has a uniquely defined meaning. $a \times 3$ has been arbitrarily chosen as shorthand for $a + a + a$. It cannot mean anything else!

a^3 has been, equally arbitrarily, chosen as shorthand for $a \times a \times a$. It means precisely this.

$3 \times a$ is shorthand for $3a$, but note that the omission of the \times sign is possible only between a number and a letter (and only in that order). Omitting it from any other combination would lead to something different from a product, e.g. 33 is not 3×3 ; aa or $a3$ means a single variable consisting of two symbols each.

Always consider the (unique!) meaning of the maths you write.