



## Why

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## Definition

Let  $a \in \mathbf{Z}$  and let  $p \in \mathbf{N}$ . Define the first power of  $a$  to be  $a$ . Define the second power of  $a$  to be  $a^2$ . Define the  $p$ th power of  $a$  for  $p \geq 2$  to be  $a^p = aa^{p-1}$ .

## Negative powers

Let  $a \in \mathbf{Z}$  and let  $p \in \mathbf{Z}$  with  $p < 0$ . Then define  $a^p$  to be  $1/a^{-p}$ . Since  $p$  is negative,  $-p$  is positive and so we have defined  $a^{-p}$ .

## Zero

Define  $a^0 = 1$ .

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<sup>1</sup>Future editions will include. This sheet include only a very basic outline of a few definitions.



