

# Integer Powers

## 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 pth 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  $a^0 = 1$ .

 $<sup>^{1}\</sup>mathrm{Future}$  editions will include. This sheet include only a very basic outline of a few definitions.

