



## INTEGER ARITHMETIC

### Why

What are addition and multiplication for integers? What are the identity elements?

### Definition

We call the operation of forming integer sums *integer addition*. We call the operation of forming integer products *integer multiplication*.

### Results

It is easy to see the following.<sup>1</sup>

**Proposition 1.** *The additive identity for  $\mathbf{Z}$  is  $[(0, 0)]$ .*

**Proposition 2.** *The multiplicative identity for  $\mathbf{Z}$  is  $[(0, 0)]$ .*

### Notation

We denote the additive identity of  $\mathbf{Z}$  by  $0_{\mathbf{Z}}$  and the multiplicative identity by  $1_{\mathbf{Z}}$ . We denote the set  $\{z \in \mathbf{Z} \mid z \geq 0_{\mathbf{Z}}\}$  by  $\mathbf{Z}_+$ .

### Distributive

**Proposition 3.** *For integers  $x, y, z \in \mathbf{Z}$ ,  $x \cdot (y + z) = x \cdot y + x \cdot z$ .*<sup>2</sup>

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<sup>1</sup>Nonetheless, the full accounts will appear in future editions.

<sup>2</sup>An account will appear in future editions.



