



## Why

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

## Definition

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

## Results

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

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

**Proposition 2.** *The multiplicative identity for  $\mathbf{Z}$  is  $[(1_{\mathbf{Z}}, 1_{\mathbf{Z}})]$ .*

## Notation

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

## Distributive

**Proposition 3.** *For rationals  $x, y, z \in \mathbf{Z}$ ,  $x \cdot (y + z) = x \cdot y + x \cdot z$ .*<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.



