

REAL SUMS

Why

We want to add real numbers.¹

Definition

The real sum of two real numbers R and S is the set

$$\{t \in \mathbf{Q} \mid \exists r \in R, s \in S \text{ with } t = r + s\}.$$

Notation

We denote the sum of two real numbers x and y by x + y.

Properties

We can show the following.²

Proposition 1 (Associative). x + (y + z) = (x + y) + z

Proposition 2 (Commutative). x + y = y + x

Proposition 3 (Identity). The set of negative rational numbers is the additive identity.

We denote the additive identity of R under + by 0_R . When it is clear from context, we call 0_R "zero".

¹Future editions will expand.

²Accounts will appear in future editions.

