



INTEGER RATIONAL HOMOMORPHISM

Why

Do the integer numbers correspond (in the sense of Homomorphisms) to elements of the rationals.

Main Result

Indeed, roughly speaking the integers correspond to rationals whose denominator is 1. Define

$$\tilde{Q} := \{[(a, b)] \in \mathbf{Q} \mid b = 1_{\mathbf{Z}}\}.$$

Proposition 1. *The rings $(\tilde{Q}, +_{\mathbf{Q}} \mid \tilde{Q}, \cdot_{\mathbf{Q}} \mid \tilde{Q})$ and $(\mathbf{Z}, +_{\mathbf{Z}}, \cdot_{\mathbf{Z}})$ are homomorphic.¹*

Proof. The function is $f : \mathbf{Z} \rightarrow \mathbf{Q}$ with $f(z) = [(z, 1)]$.² □

¹Indeed, more is true and will be included in future editions. There is an *order perserving* ring homomorphism.

²The full account will appear in future editions.

