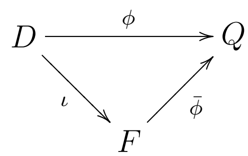
1. Suppose that D is an integral domain and that $F = \{\, a/b : a, b \in D \text{ and } b \neq 0 \,\}$ is the field of fractions in D constructed in lecture. Let $\iota : D \to F$ be given by $\iota(a) := a/1$. Show that if $\phi : D \to Q$ is an *injective* ring homomorphism into a field Q, then there is an injective ring homomorphism $\bar{\phi} : F \to Q$ such that



commutes. *I forgot to insist that ϕ should be injective in the version of the theorem I stated in lecture.* Show that if ϕ is not injective, then there is no homomorphism $\bar{\phi}$ that makes the diagram commute.