finite extensions of Dedekind domains are Dedekind

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Theorem. *Let R be a Dedekind domain with field of fractions K. If L/K is a finite extension of fields and A is the integral closure of R in L, then A is also a Dedekind domain.*

For example, a number field K is a finite extension of $\mathbb{Q}$ and its ring of integers is denoted by $\mathcal{O}_K$. Although such rings can fail to be unique factorization domains, the above theorem shows that they are always Dedekind domains and therefore `http://planetmath.org/IdealDecompositionInDedekindDomain`unique factorization of ideals is satisfied.