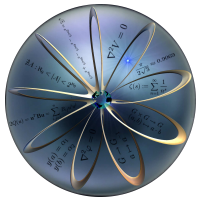

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proof of finite extensions of Dedekind domains are Dedekind

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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 we show that A is also a Dedekind domain.

We procede by splitting the proof up into the separable and purely inseparable cases. Letting F consist of all elements of L which are separable over K, then F/K is a separable extension and L/F is a purely inseparable extension.

First, the integral closure B of R in F is a Dedekind domain (see proof of finite separable extensions of Dedekind domains are Dedekind). Then, as A is integrally closed and contains B, it is equal to the integral closure of B in L and, therefore, is a Dedekind domain (see proof of finite inseparable extensions of Dedekind domains are Dedekind).