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Title:	On Dedekind's theorem for splitting of primes in Algebraic number fields
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Abstract:	<p>Let <math>K = \mathbb{Q}(\theta)</math> be an algebraic number field with <math>\theta</math> in the ring <math>OK</math> of algebraic integers of <math>K</math> and <math>f(x)</math> be the minimal polynomial of <math>\theta</math> over the field <math>\mathbb{Q}</math> of rational numbers. For a rational prime <math>p</math>, let <math>f(x) = g_1(x)^{e_1} \dots g_r(x)^{e_r}</math> be the factorization of the polynomial <math>f(x)</math> obtained by replacing each coefficient of <math>f(x)</math> modulo <math>p</math> into product of powers of distinct irreducible polynomials over <math>\mathbb{Z}/p\mathbb{Z}</math> with <math>g_i(x)</math> monic. In 1878, Dedekind proved that if <math>p</math> does not divide <math>[OK : \mathbb{Z}[\theta]]</math>, then <math>pOK = \wp_1 e_1 \dots \wp_r e_r</math>, where <math>\wp_1, \dots, \wp_r</math> are distinct prime ideals of <math>OK</math>, <math>\wp_i = pOK + g_i(\theta)OK</math> with residual degree of <math>(\wp_i/p) = \deg g_i(x)</math> where <math>i = 1, 2, \dots</math>. He also gave a criterion which says that <math>p</math> does not divide <math>[OK : \mathbb{Z}[\theta]]</math> if and only if for each <math>i</math>, we have either <math>e_i = 1</math> or <math>g_i(x)</math> does not divide <math>M(x)</math> where <math>M(x) = p(f(x) - g_1(x)^{e_1} \dots g_r(x)^{e_r})</math>. In this work we prove the theorem and the criterion too while giving applications its due.</p>
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