An ABC construction of number fields

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Abstract. We discuss a general technique for constructing number fields with interesting nonsolvable Galois groups and ramified at a very few small primes only. The construction involves extremal solutions to the matrix equation $ABC = 1$, extremal solutions to the polynomial equation $A(x)+B(x)+C(x) = 0$, and solutions to $A + B + C = 0$ in integers as well. We illustrate the technique with examples where the number fields constructed have absolute discriminant of the form $2^a\ 3^b$.