Problemen

Problem Section

Problem A (proposed by Raymond van Bommel and Julian Lyczak)

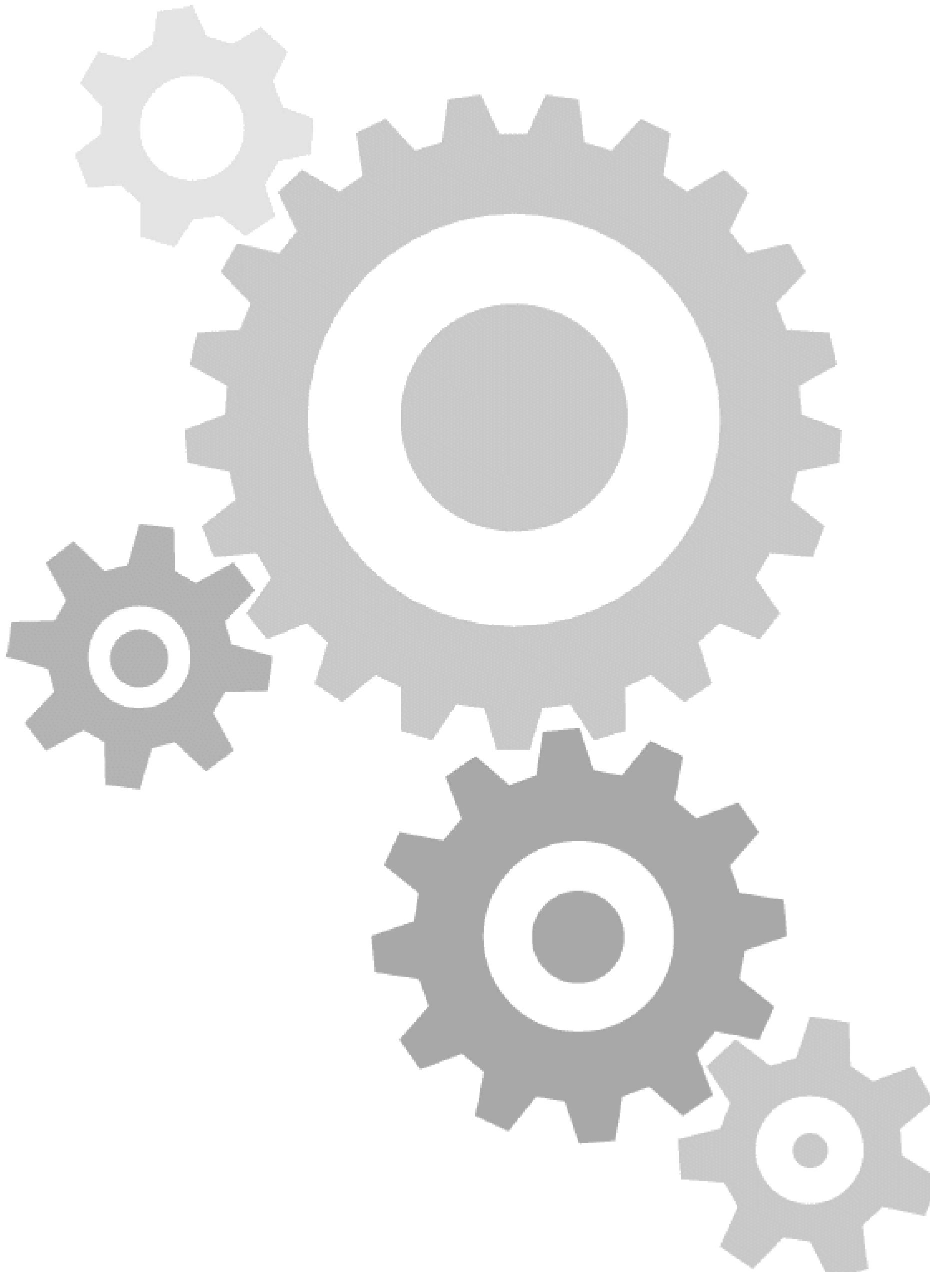
A commutative ring R is *charming* if every ideal of R is an intersection of maximal ideals. Prove that a Noetherian charming ring is a finite product of fields. Does there exist a charming ring that is not a product of fields?

Problem B (folklore)

Let S be a set of prime numbers with the following property: for all $n \geq 0$ and distinct $p_1, \ldots, p_n \in S$ the prime divisors of $p_1 \cdots p_n + 1$ are also in S. Show that S contains all primes.

Problem C (proposed by Roberto Stockli)

Determine all pairs (p, q) of odd primes with $q \equiv 3 \bmod 8$ such that $\frac{1}{p}(q^{p-1} - 1)$ is a perfect square.



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