Avd. Matematik
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Some general comments: If you cannot solve the full exercise, you may solve it in some special cases, to begin with. However, you should note which cases your solution covers.

1. Express $\cos(2\pi/7)$ by means of radicals.

2. a) Give the full set of odd primes $p < 100$, such that the regular p-gon is constructible by means of compass and (unmarked) ruler only. Let their number be n

    b) Find at least $2n$ *other* odd primes p, such that the regular p-gon is constructible by means of compass and a marked ruler only (where the marked ruler may be used in the archimedian manner).
    In particular, indicate briefly how the regular heptagon ("7-gon") may be constructed in this manner.

3. For each prime p, let $K(p)$ be the splitting field of $t^4 + pt + p$ over $\mathbf{Q}$. Determine the Galois group $\Gamma(K(p), \mathbf{Q})$ for each p. (Note that $p = 3$ and $p = 5$ are special.)