Homework 6

Deadline: Tuesday, December 2 at 14:00.

Please submit your solutions either on paper at the beginning of the practicals or as a pdf-file in https://owl.mff.cuni.cz/ . Everything that is not immediately obvious needs to be proved or quoted from lecture notes.

1. Show that $x^4 + 1$ is irreducible in $\mathbb{Z}[x]$ but it is reducible in $\mathbb{Z}_p[x]$ for all prime p.
   Hint: Show the second part with three cases ($p = 2, p \equiv 1 \mod 4, p \equiv 3 \mod 4$).