GALOIS THEORY 2019: HW 2 Feedback
For assessment: Problems 1, 2, 3
Due by noon Tuesday, week 5 of the term

1. This proof requires showing that $f(\tau(\alpha)) = \tau(f(\alpha))$; this can be separated from assuming that $f(\alpha) = 0$ or that $f(\tau(\alpha)) = 0$ (and then you need to prove $f(\tau(\alpha)) = \tau(f(\alpha))$ only once).

   Once one has $\tau(f(\alpha)) = 0$, one needs to use that, being a field homomorphism, τ is **injective** so that one can then conclude $f(\alpha) = 0$.

   We did not assume that $L : K$ is an algebraic extension, so we do not know that $\tau(L) = L$, and so we do not know that $\tau^{-1} : L \to L$ **exists**.

   Use of language:

   (i) It does not make sense to write, "Suppose $f(\alpha) = 0$. Let $f = a_0 + \cdots + a_n t^n$". You need either to first let $f = a_0 + \cdots + a_n t^n$ and then suppose $f(\alpha) = 0$, or you can suppose $f(\alpha) = 0$ and then "**write** $f = \ldots$".

   (ii) When one writes, "If $f(\alpha) = 0$...", the hypothesis that $f(\alpha) = 0$ only lasts for the rest of that sentence. However, if you write "Suppose $f(alpha) = 0$...", the hypothesis lasts until you reset the hypotheses.

2. Overall, this problem was done very well.

3. This problem was also done very well.