FINAL EXAM: COMMON MISTAKES
MATH 104, SECTION 6

Problem 1

- $\lim_{n\to\infty} |a_{n+1} - a_n| = 0$ does NOT imply (a_n) is convergent. (This is NOT the Cauchy criterion.)

Problem 2

- One can't only deal with the case where the roots of $P(x)$ are all of multiplicity 1.

Problem 3

- It is not possible to use the Weierstrass M-test to show that this series of functions converges uniformly.
- Many of you use the alternating series test to show that the series converges, but didn't show that it converges UNIFORMLY.

Problem 6

- In the metric space S_2, Heine–Borel theorem no longer holds. The theorem that "compact $\Longrightarrow$ closed and bounded" still holds, but the converse is not true. Moreover, the closed (or bounded, connected) subsets in $\mathbb{R}$ with respect to different distance functions are also different.