All problems are in the ”3rd” edition Hungerfold textbook.

(1) If \( f \in \mathbb{Z}_2[x] \), prove that \( f(x^2) = (f(x))^2 \).

(2) You may use (1) to prove that if \( \alpha \) is a root of \( f(x) \), then \( \alpha^2 \) will also be a root of \( f(x) \).

(3) Exercise 5.3 #3-13. Exercise 6.1 #1-3.