

All problems are in the "3rd" edition Hungerford 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  $f(x)$ .  
(this problem may be useful to do Exercise 5.3 #9 (b))

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