

Additional homework problems

1. Let F be any field. Prove that for every x in F , $x \cdot 0 = 0$. Do this using just the properties listed on pages 2 and 3 of the textbook.
Hint: Look at the proof of Proposition 1.4 on page 12.
2. Prove that if x is any element of a field F , then $(-x)(-x) = x^2$. Again, just use the properties listed on pages 2 and 3 of the textbook.
3. Let F_2 be the field with two elements. Find a polynomial of degree 2 with coefficients in F_2 that has no roots in F_2 . (Hint: Use trial and error if necessary.)