

ABSTRACT ALGEBRA 2 - SPRING 2017 - ASSIGNMENT 9

- 1) Find the splitting field of $x^3 + 2x + 1$ over \mathbb{Z}_3
- 2) Prove that $x^{21} + 2x^8 + 1$ has no multiple zeroes over any extension of \mathbb{Z}_3
- 3) Show that $x^{19} + x^8 + 1$ has multiple zeroes in some extension of \mathbb{Z}_3
- 4) Find the splitting field of $x^4 - x^2 - 2$ over \mathbb{Z}_3
- 5) If $p(x) \in F[x]$ and $\partial p = n$, show that the splitting field of $p(x)$ has degree over F at most $n!$
- 6) Show that $x^4 - 6x^2 - 7$ splits over $\mathbb{Q}(\sqrt{7}, i)$