

QUIZ 4

Math 145, Abstract Algebra, Duchin

(1) Using the definition of $F[x]$ as all polynomials in x with coefficients in F , explain why $\mathbb{Q}[\sqrt{3}] = \{a + b\sqrt{3} : a, b \in \mathbb{Q}\}$.

(2) Using the definition of $F(x)$ as the smallest field containing F and x , explain why $\mathbb{Q}(\sqrt{3}) = \mathbb{Q}[\sqrt{3}]$.

(3) How many polynomials of degree three are there in $\mathbb{Z}_2[x]$? How many of them are monic?