

392 HOMEWORK 3

- I want to give you a break this week to give you a chance to think carefully about the theory in sections 4.1 and 4.2. So this week's homework is a short one.
- The first question is a repeat of one I set last week which had a typo in it – please redo this question just to make sure you understood it. Suppose that $f(x)$ is a monic polynomial in $\mathbb{Z}[x]$. Let $\alpha \in \mathbb{Q}$ be a root of $f(x)$. Show that $\alpha \in \mathbb{Z}$. (*Hint.* Let $\alpha = \frac{a}{b}$ with $\text{GCD}(a, b) = 1$. Let $f(x) = x^n + a_{n-1}x^{n-1} + \cdots + a_1x + a_0$. Now substitute α in for x and multiply through by b^{n-1} .)
- Exercises 4.1 1,2,3,4(b)(c),5,7.