Assignment 6 – Part 1 – Math 412

Textbook exercises:[1]

Section 4.1: 10, 16(WI), 22

Other exercises:

(1) Let R be a commutative ring and let $f, g \in R[x]$.

(a) Show that $\deg(f+g) \leq \max(\deg(f), \deg(g))$.

(b) Show that if $\deg(f) \neq \deg(g)$, then $\deg(f+g) = \max(\deg(f), \deg(g))$.

(2) (a) Show that $1+2x$ is a unit in $(\mathbf{Z}/4\mathbf{Z})[x]$.

(b) Show that $1+10x$ is a unit in $(\mathbf{Z}/25\mathbf{Z})[x]$.

(c) Is $1+3x$ a unit in $(\mathbf{Z}/6\mathbf{Z})[x]$?

[1] From Hungerford's *Abstract algebra, An introduction, Third edition*