Assignment 8

MA08 Applied Algebra Deadline 05:00 PM, Friday, 20190719

1. Find the sum and the product of the given polynomials in the given polynomial ring.

   (a) $p(x) = x + 1, \quad q(x) = x + 2$ in $\mathbb{Z}_2[x]$

   (b) $p(x) = 2x^2 + 3x + 4, \quad q(x) = 3x^2 + 2x + 3$ in $\mathbb{Z}_6[x]$

2. By using Theorem 10.2, compute for the indicated ring homomorphism $f_3[(x^4 + 2x)(x^3 - 3x^2 + 3)]$

3. According to Theorem 10.3, find $q(x)$ and $r(x)$ by using division algorithm so that $f(x) = g(x)q(x) + r(x)$ with either $\deg r(x) < \deg g(x)$ or $r(x)$ is a zero polynomial.

   (a) $f(x) = x^6 + 3x^5 + 4x^2 - 3x + 2$ and $g(x) = x^2 + 2x - 3$ in $\mathbb{Z}_7[x]$

   (b) $f(x) = x^5 - 2x^4 + 3x - 5$ and $g(x) = 2x + 1$ in $\mathbb{Z}_{11}[x]$

   Notice: Please write Your Name and Student ID when you submit.