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# Assignment 8

MA08 Applied Algebra

Deadline 05:00 PM, Wednesday, 20190724

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1. Find the sum and the product of the given polynomials in the given polynomial ring.
  - (a)  $p(x) = x + 1$ ,  $q(x) = x + 2$  in  $\mathbb{Z}_2[x]$
  - (b)  $p(x) = 2x^2 + 3x + 4$ ,  $q(x) = 3x^2 + 2x + 3$  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.