

Homework # 15- Due Tuesday 3/21/06, Assigned 3/16/06

1. Let $P(x) = 2x^4 + 3x^3 - 6x^2 - 5x + 6$, and $Q(x) = x^4 + 6x^3 - 11x^2 - 24x + 28$. Using the Euclidean Algorithm find a gcd $D(x) = (P(x), Q(x))$. Then find polynomials $S(x)$ and $T(x)$ so that $D = SP + TQ$.

2. Consider the evaluation homomorphism

$$ev_5 : \mathbb{Q}[x] \rightarrow \mathbb{Q}.$$

Find four elements in the kernel. (The kernel of a ring homomorphism is everything that maps to 0)

3. The polynomial $2x^3 + 3x^2 - 7x - 5$ can be factored into linear factors in $\mathbb{Z}_{11}[x]$. Find this factorization.