

GRV II : HW 12

1. Determine whether the following polynomials are irreducible in the rings indicated.
 - (i) $x^3 + x + 1$ in $\mathbf{F}_3[x]$
 - (ii) $x^4 - 4x^3 + 6$ in $\mathbf{Z}[x]$
 - (iii) $x^4 + 4x^3 + 6x^2 + 2x + 1$ in $\mathbf{Z}[x]$ [Substitute $x - 1$ for x]
 - (iv) $x^3 + x - 1$ in $\mathbf{Z}[x]$.
2. Find a generator of the group $(\mathbf{Z}/7\mathbf{Z})^\times$.