

Math 120c
Lloyd Kilford

Coursework 6
Due: 19th May 2003

You may use theorems from class without proof, as long as you state them clearly.

1. Write down a real transcendental number which is not e , π or Liouville's constant, and prove that it is transcendental.
2. Let K be the splitting field over \mathbf{Q} of $(x^2 - 2)(x^2 - 5)(x^2 - 7)$. Find an element α in K such that $K = \mathbf{Q}(\alpha)$. (You must show that $E = \mathbf{Q}[\alpha]$).
3. Let p be a prime number, and let K be the splitting field over \mathbf{Q} of the polynomial $x^5 - 5p^4x + p$. What is the Galois group of K/\mathbf{Q} ?