M2P4 Rings and Fields Test 1.

30 January 2008

1. Find all the zero divisors in the ring $\mathbb{Z}/2008$. (Justify your answer. Hint: 251 is a prime.)

2. Is 29 an irreducible element of $\mathbb{Z}[\sqrt{-7}]$? (If you think it is irreducible you need to give a proof, and if you think it is reducible, write 29 as a product of two non-units.)

3. What is the minimal polynomial of $e^{\frac{\pi i}{4}}$ over \mathbb{R} ? Over \mathbb{Q} ? (Justify your answers.)