UNIVERSITY OF ST ANDREWS

Finite Mathematics Problem Set 1

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October 28, 2015

1 EXERCISE 1

Use the Extended Euclidean Algorithm to compute the greatest common divisors (and the linear combinations of the arguments leading to the common divisors of

- 17 and 23
- 2^{17} and 3^{23}
- $20!+1$ and $17!+2$.

2 EXERCISE 2

Compute $17^{129} \mod 361$,

3 EXERCISE 3

Compute the smallest positive number x, such that $17x \equiv 1 \mod 65537$.

4 EXERCISE 4

- find all the subgroups of the *additive* group of $\mathbb{Z}/17\mathbb{Z}$.
- find all the subgroups of the *multiplicative* group of $\mathbb{Z}/17\mathbb{Z}$.
- In both cases, find all the cosets of the subgroups you find.