Assignment 8, due March 18

Problem 1

Show that the group U_{27} is isomorphic to U_{19}.

Problem 2

Check that 3 is a primitive root $(\mathrm{mod}\, 31)$. Use it to solve

$$x^3 \equiv 8 (\mathrm{mod}\, 31).$$

Problem 3

Represent U_{18200} as a product of maximal possible number of non-trivial cyclic groups. Use it to compute $e(18200)$.

Problem 4

Find all n for which $U_n \cong \mathbb{Z}_3 \times \mathbb{Z}_2$.

Problem 5

Show that if $n > 1$ is an odd natural number then $e(8n) = e(n)$.