Exercise sheet 5

1. Compute the prime decomposition of 68 310

2. Find the remainder when you divide 40^{220} by 23.

3. Find the remainder when you divide 6^{26} by 14.

4. Find all $x \in \mathbb{Z}$ such that $55x \equiv 1 (\mathrm{mod}\, 97)$.

5. Find the remainder when you divide 55^{95} by 97. Use the fact that 97 is a prime.