Math 3 - Discrete math (V3020) Exercises, week 3 (due Sep 23rd, 2025)

1. Write a complete residue system modulo 11 composed entirely of multiples of 3.
2. Write any reduced residue system for modulus 12.
3. Evaluate the Euler's ϕ-function $\phi(m)$ for $m = 1, 2, \ldots, 11$.
4. Prove that if p is a prime number and $a^2 \equiv b^2 \mod p$, then $p \mid (a+b)$ or $p \mid (a-b)$.
5. Find all integers that satisfy simultaneously

$$\begin{aligned} x &\equiv 2 \mod 3, \\ x &\equiv 1 \mod 5, \\ x &\equiv 5 \mod 2. \end{aligned}$$