

Some useful number theory facts

- ① If $a, b \in \mathbb{Z}$ are relatively prime, that is $\gcd(a, b) = 1$, then $\exists x, y \in \mathbb{Z}$ with $ax + by = 1$.
- ② Let p be a prime and $a, b \in \mathbb{Z}$. If $p \mid ab$ then $p \mid a$ or $p \mid b$.
- ③ Division algorithm: If $a, b \in \mathbb{Z}$ and $b \neq 0$, then $\exists! q, r \in \mathbb{Z}$ with $a = qb + r$ and $0 \leq r < |b|$.