**Exercise 1.** Let $n \in \mathbb{N}$ and $a \in \mathbb{Z}$ with $\gcd(a, n) = 1$.

    **a.** Use Bézout's Lemma to write $ra + sn = 1$ for some $r, s \in \mathbb{Z}$. Conclude that $R_n(a) \in U(n)$.

    **b.** With $r, s$ as above, explain why we also have $R_n(r) \in U(n)$. Show that $R_n(r) \otimes R_n(a) = 1$ in $U(n)$.

**Exercise 2.** Textbook exercise II.1.6.

**Exercise 3.** Textbook exercise II.1.3.