1. Let $R$ be a Euclidean domain. State the theorem concerning uniqueness of factoring non-zero, non-unit elements.

**Solution.** Let $R$ be a Euclidean domain. Suppose $p_1 \cdots p_r = q_1 \cdots q_s$, where each $p_i, q_j$ in $R$ is an irreducible element. Then $r = s$ and after re-indexing the $q_j$, $q_i = u_ip_i$, for units $u_i \in R$, for all $1 \leq i \leq r$.

2. Let $R$ be a Euclidean domain. State the theorem concerning the existence of factoring non-zero, non-unit elements.

**Solution.** Let $R$ be a Euclidean domain. There every non-zero, non-unit element in $R$ can be written as a product of irreducible elements.