1 Let A be a commutative ring. Let M be a module, and N a submodule. Let $N = Q_1 \cap ... \cap Q_r$ be a primary decomposition of N. Let $\bar{Q}_i = Q_1/N$. Show that $0 = \bar{Q}_1 \cap ... \bar{Q}_r$ is a primary decomposition of 0 in M/N. State and prove the converse.

Firstly, let's take a concrete example, $A = \mathbb{Z}$, $M = \mathbb{Z}_{24}$, $N = \mathbb{Z}_{12}$