1. What do you think a submodule is? Or a homomorphism of $R$-modules?

2. Let $R$ be a ring. Consider the polynomial ring $R[x, y]$. The set $M$ of all polynomials in $x, y$ of degree three or higher is a $R[x, y]$-module. Find a generating set for $M$.

3. Let $M, N$ be $R$-modules and $N$ a submodule of $M$. Suppose that $N$ and $M/N$ are finitely generated. Why must $M$ be finitely generated?