MATH 299Q: Homework 2
Quiver Representations

1. Prove the First Isomorphism Theorem (for quiver representations).

   Theorem. *Let Q be a quiver with representations M and N. If $f : M \to N$ is a morphism of representations then*

   $$\operatorname{im} f \cong M/\ker f.$$

2. Given the following quiver, construct a short exact sequence of representations.

   $$Q : \quad 1 \longrightarrow 2$$

   [*Hint: Find indecomposable representations.*]