

Method 1: Using package xy

$$\begin{array}{ccccccc}
 & H^{k+1}(M) & \xrightarrow{i^*} & \dots & & & \\
 \curvearrowright & & & & & d^* & \curvearrowright \\
 & H^k(M) & \xrightarrow{i^*} & H^k(U) \oplus H^k(V) & \xrightarrow{j^*} & H^k(U \cap V) & \\
 \curvearrowright & & & & & d^* & \curvearrowright \\
 & & & \dots & \xrightarrow{j^*} & H^{k-1}(U \cap V) & \curvearrowright
 \end{array}$$

Method 2: Using package tikz-cd

$$\begin{array}{ccccccc}
 \hookrightarrow & H^{k+1}(M) & \xrightarrow{i^*} & \dots & & & \\
 & & & & \searrow & d^* & \\
 \hookrightarrow & H^k(M) & \xrightarrow{i^*} & H^k(U) \oplus H^k(V) & \xrightarrow{j^*} & H^k(U \cap V) & \hookrightarrow \\
 & & & & \searrow & d^* & \\
 & & & \dots & \xrightarrow{j^*} & H^{k-1}(U \cap V) & \hookrightarrow
 \end{array}$$

Method 3: Using package tikz

$$\begin{array}{ccccccc}
 & & H^{k+1}(M) & \xrightarrow{i^*} & \dots & & \\
 & \curvearrowright & & & & & \\
 & & & & d^* & & \\
 & \curvearrowright & & & & & \\
 & & H^k(M) & \xrightarrow{i^*} & H^k(U) \oplus H^k(V) & \xrightarrow{j^*} & H^k(U \cap V) \\
 & \curvearrowright & & & & & \\
 & & & & d^* & & \\
 & \curvearrowright & & & & & \\
 & & & & & \dots \xrightarrow{j^*} & H^{k-1}(U \cap V)
 \end{array}$$