Definition (Graph). A (directed) *graph* $\mathcal{G} = \langle \mathbf{V}, \mathbf{A}, s, t \rangle$ consists of a set of vertices $\mathbf{V}$, a set of arrows $\mathbf{A}$, and two functions $s, t : \mathbf{A} \to \mathbf{V}$, called the *source* and *target* functions, respectively. Given $a \in \mathbf{A}$ with $s(a) = v$ and $t(a) = w$, we say that a is an *arrow* from v to w.