

**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  $s, t : \mathbf{A} \rightarrow \mathbf{V}$ , 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  $w$ .