Walks, trails, circuits, paths, and cycles

A walk in an undirected graph:

a walk from v_0 to v_i in an undirected graph G is a sequence of alternating vertices and edges that starts with vertex v_0 and ends with vertex v_i

Notation:

$$\langle v_0, \{v_0, v_1\}, v_1, \{v_1, v_2\}, v_2, \ldots, v_{i-1}, \{v_{i-1}, v_i\}, v_i \rangle$$

Alternate notation:

$$\langle v_0, v_1, v_2, \ldots, v_{i-1}, v_i \rangle$$

the length of a walk is equal to the # of edges in the walk

an open walk is a walk where $v_0 \neq v_i$

a closed walk is a walk where $v_0 = v_i$

a trail is an open walk in which no edge repeats

a circuit is a closed walk in which no edge repeats

a path is a trail in which no vertex repeats

a cycle is a circuit of length ≥ 1 in which no vertex repeats