

# Graph theory

A graph is traditionally a "bare bones" model of something.

A graph  $G$  consists of

$V(G)$  — the set of vertices (nodes, points, ...)

$E(G)$  — the set of edges (arcs, links, lines, ...)

Something that says how the edges are connecting vertices — varies between graph ~~concepts~~ formalisms.

Simple graph      edge  $uv$ , endpoint

Multigraph

Pseudograph

Directed graph (digraph)

Adjacent and incident

Neighbourhood  $N(u)$

Degree  $d(u)$

Max-degree  $\Delta(G)$

Min-degree  $\delta(G)$

Regular graph

} +in/out-versions

Standard families of graphs:

path  $P_n$

cycle  $C_n$

complete  $K_n$

complete bipartite  $K_{n,m}$

hypercube  $Q_k$

Petersen graph  $\subset K$

( $K_{n,1}$  star)

degree asymptotics