

Regular Structures

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Outline

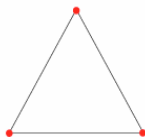
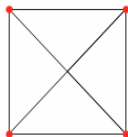
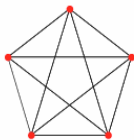
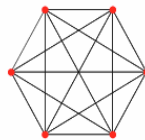
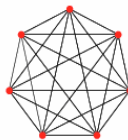
- 1 Regular Graphs
 - Complete Graphs
- 2 Complete Bipartite Graphs
- 3 Cycles, Stars, and Wheels
- 4 Grid Graphs

Regular Graphs

A regular graph is a graph where each vertex has the same number of neighbors; i.e. every vertex has the same degree. A regular directed graph must also satisfy the stronger condition that the indegree and outdegree of each vertex are equal to each other.

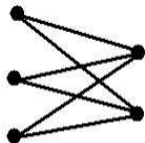
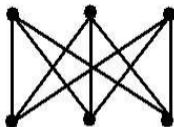
Complete Graphs

The K_n is a graph with n vertices said to be *complete graph* if every vertex in K_n is connected to every other vertex in K_n .

 K_2  K_3  K_4  K_5  K_6  K_7

Complete Bipartite Graph $K_{n,m}$

A complete bipartite graph $K_{m,n}$ is a bipartite graph that has each vertex from one set adjacent to each vertex in the other set.

 $K_{2,3}$  $K_{3,3}$

Cycle Graph

Cycle Graph outputs a graph which is a cycle on n vertices, labeled $1, 2, \dots, n$.

Star Graph

A star graph is the complete bipartite graph $K_{1,k}$; a tree with one internal node and k leaves.

Wheel Graph

A wheel graph is a graph formed by connecting a single universal vertex to all vertices of a cycle.

Maple Command: CycleGraph, StarGraph, WheelGraph.

Grid Graphs

A two-dimensional grid graph, also known as a square grid graph, is an $m \times n$ lattice graph with $m * n$ vertices.

Maple Command: GridGraph