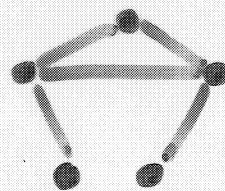
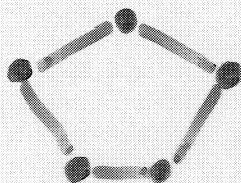
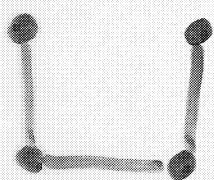


A quick observation is that if T has 6 nodes (has order 6), then either T or \bar{T} must contain a triangle. This can be seen by picking a node v and noticing that in either T or \bar{T} , v must have at least 3 of the other 5 nodes as neighbours. Label these nodes a, b and c . If any two of a, b and c are neighbours, then that pair, together with v , form a triangle. If none of them are neighbours of one another, then they form a triangle in their complement graph!

A popular interpretation of this is that any group of six folk in the same room contains either three people who know each other or three who don't. The study of the generalizations of this is called Ramsey Theory.

A graph T is self-complementary if $T \cong \bar{T}$. Such graphs have order $4n$ or $4n+1$ ($n \in \mathbb{N}$). For example:



Given two graphs T_1 and T_2 , we define ...

- $T_1 \cup T_2$ by having nodes $V_1 \cup V_2$ and edges $E_1 \cup E_2$.
- $T_1 + T_2$, their join, to be $T_1 \cup T_2$ with additional edges joining each node $v \in V_1$ to each node $w \in V_2$.
- $T_1 \times T_2$ has nodes $V_1 \times V_2$ with edges $(a_1, a_2) - (b_1, b_2)$ if either $a_1 = b_1$ with $a_2 - b_2 \in E_2$ or $a_2 = b_2$ with $a_1 - b_1 \in E_1$.
- $T_1 \circ T_2$, their corona, is built by pinning copies of T_2 to each node in T_1 . For example ...