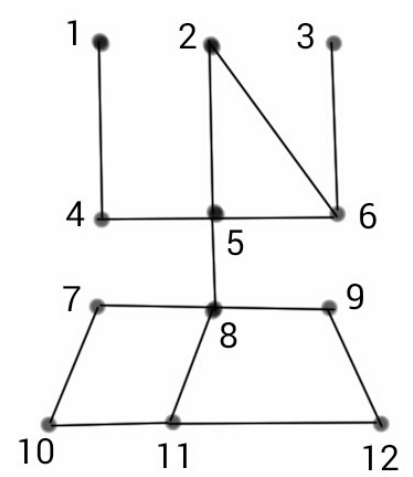
Matchings

Definitions

- A matching in a graph G is a set of (non-loop) edges with no shared end-points. The vertices incident to edges in a matching are called matched or saturated. Others are unsaturated.
- A perfect matching in a graph is a matching that saturates every vertex.
- A maximal matching in a graph is a matching that cannot be enlarged by adding an edge.
- A maximum matching is a matching of maximum size (# edges) among all matchings in a graph.

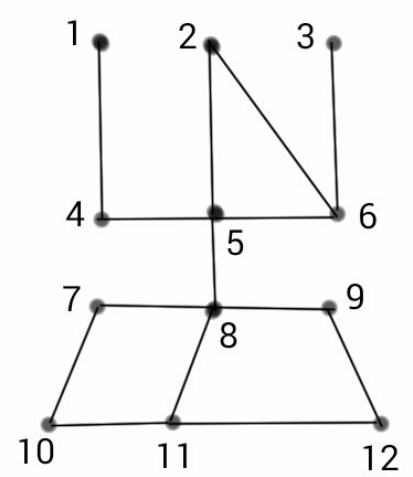
Matchings: Pop Quiz



Give an example of the following, if possible:

1. A maximal matching in G which is not a maximum matching.
2. A maximum matching in G. How do you know it is maximum?
3. Can there be more than one maximum matching in a graph?
4. A graph which has no perfect matching but has a maximum matching. Is G such a graph?

Matchings: Pop Quiz



- Perfect matching $\implies$ maximum matching $\implies$ maximal matching
- The reverse directions in the above implications do not hold.