This homework set has three questions, each one with increasing difficulty. You must work in pairs to determine the solutions.

Every member of the team must be able to explain how you arrived at the answer.

You may be asked to present your answer on the blackboard.

1. A oriented complete graph is called a tournament. Show that every tournament contains a (directed) Hamilton path.

2. Show that every uniquely 3-edge-colourable cubic graph is hamiltonian. ('Unique' means that all 3-edge-colorings induce the same edge partition.).

3. (*)Prove or disprove the following strengthening of Proposition 10.1.2: 'Every k-connected graph $G$ with $|G| \geq 3$ and $\chi(G) \geq |G|/k$ has a Hamilton cycle'.