HW 1. GRAPH THEORY. WTR 2016. MONTGOMERY.

1. Write down an explicit isomorphism between the Star-of-David graph and the Pentagon graph.

2. Prove or disprove: up to isomorphism, there is only one 2-regular graph on 5 vertices.

3. Prove or disprove: up to isomorphism there is only one 2-regular graph on 6 vertices.

4. Now add the adjective "connected" for the graphs of problems 2 and 3. Does this change the answer? How?

5. Formulate analogues of problem 1, 2, 3, and 4 for n vertices. Discuss how the answers change depend on the parity of n.

6. Draw a 3-regular graph on 4 vertices. On 6.

7 (*) 7. Prove or disprove: there is 3-regular graph on 5 vertices.

8 (*) . Draw all possible labelled trees on 3 vertices. On 4. On 5.

NOTE (*)ed problems are the most important problems, and most likely to be graded.