

Remember that, although you are encouraged to work together, all of your write-ups must be your own (no copying someone else's solution - not even with minor wording changes.) **List the names of everyone you worked with on the HW!** You are encouraged to **not** look online for solutions - your time is better spent wrestling with the proof yourself or getting help from the professor, than squandering it online.

1. READING

- Read Pages 6 - 30 of the text. (You may skip unassigned problems)
- Memorize the definition of **chromatic number, path, cycle, planar graph, subgraph, connected, graph isomorphism, girth, Petersen graph, vertex transitive, walk, trail, cut edge, cut vertex, induced subgraph, Eulerian circuit, maximum, maximal.**
- Study the proofs of Lemma 1.2.15, 1.2.18, 1.2.25, 1.2.26, 1.2.27. We'll go over some of these in class.

2. TO DO

Problems:

- (1) 1.1.13 (Remember that a k -tuple in $\{0,1\}$ means a vector (x_1, \dots, x_k) with each $x_i \in \{0,1\}$.) The minimal length of a path from a vertex x to a vertex y in G is called the **Hamming distance** from x to y . This graph and distance function are important in information theory.
- (2) 1.1.18, 1.1.24 (practice with graph isomorphisms)
- (3) 1.1.26. (Hint: The fact that the graph has girth 4 means that there are no triangles. In particular, whenever $\{a,b\}$ and $\{b,c\}$ are edges with $b \neq c$, then $\{a,c\}$ is not an edge of the graph.)
- (4) 1.2.2 (practice with definitions)
- (5) 1.2.6 (practice with definitions)
- (6) 1.2.8
- (7) 1.2.12 (If you know how to program, you might write a computer program to do this!)
- (8) 1.2.25
- (9) 1.2.40 (Practice with paths)