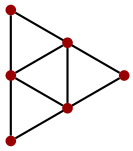
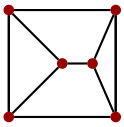
HW 9

Due: Fri, 8 Apr 2023

1. **Problem 7.1.1.** (−) For each graph G below, compute $\chi'(G)$ and draw $L(G)$.



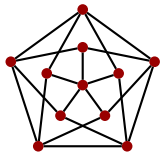


2. **Problem 7.1.3.** (−) Determine the edge-chromatic number of $C_n \,\square\, K_2$.

3. **Problem 7.1.5.** (−) Prove that the Petersen graph is the complement of $L(K_5)$.

4. **Problem 7.1.24.** (−) Let G and H be nontrivial simple graphs. Use Vizing's Theorem to prove that $\chi'(H) = \Delta(H)$ implies $\chi'(G \,\square\, H) = \Delta(G \,\square\, H)$.

5. **Problem 7.2.2.** (−) Is the Grötzsch graph (Example 5.2.2 in the text, shown below) Hamiltonian?



6. **Problem 7.2.7.** A mouse eats its way through a $3 \times 3 \times 3$ cube of cheese by eating all the $1 \times 1 \times 1$ subcubes. If it starts at a corner subcube and always moves on to an adjacent subcube (sharing a face of area 1), can it do this and eat the center subcube last? Give a method or prove impossible. (Ignore gravity.)