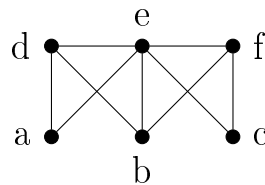
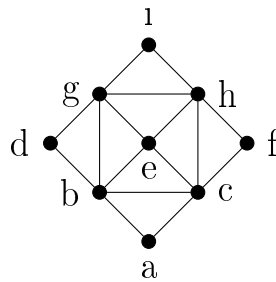


Introduction to Computer Science
Repeated Second Midterm Test, 5/8/2017

1. In a graph on 99 vertices two vertices have degree 3, and the degree of the other vertices is 4. Show that the graph contains an odd cycle.
2. We delete the edges of two vertex-disjoint cycles on 3 vertices from a complete graph on 8 vertices. Determine the chromatic number of the graph obtained.
3. Determine whether the following graph is an interval graph or not.



4. We double one edge of the complete graph on 5 vertices (i.e. we substitute one edge by two parallel edges). Determine the edge-chromatic number of the graph obtained.
5. Determine a minimum covering set of vertices in the graph below.



6. In a ball there are 601 girls and 601 boys, and everybody knows at least 300 persons of the opposite sex (acquaintances are mutual). Can we make 601 boy-girl couples in which the persons know each other for sure?

Total work time: 90 min.

The full solution of each problem (including explanations) is worth 10 points. Show all your work! Results without proper justification or work shown deserve no credit.

Notes and calculators (and similar devices) cannot be used.

Grading: 0-23 points: 1, 24-32 points: 2, 33-41 points: 3, 42-50 points: 4, 51-60 points: 5.