Repeat of the First Midterm Test

1. We roll 10 identical dices simultaneously. How many results can we get?

2. How many pairwise non-isomorphic trees are there on 11 vertices which contain only two kinds of degrees?

3. Let G be a simple 4-regular bipartite graph (i.e. in which the degree of each vertex is 4). Can G be a planar graph?

4. The graph G on 8 vertices is the disjoint union of two complete graphs on 6 vertices. At least how many edges have to be added to G such that the resulting graph is still simple and contains an Euler circuit?

5. The degree sequence of the simple graph G is 3, 3, 4, 4, 4, 4, 8, 8, 8. Does G contain a Hamilton cycle?

6. From the complete graph on 12 vertices we delete 3 vertex-disjoint cycles of length 4. Determine the chromatic number of the graph obtained this way.

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: 0-24 points: 1, 25-33 points: 2, 34-42 points: 3, 43-51 points: 4, 52-60 points: 5.