

Exercise-set 1.
Solutions

1. (a) yes, yes,
(b) no, no,
(c) no, yes,
(d) no, yes.
2. 8 (the smallest possible and also realizable degree-sequence is 0,1,2,3,4,6).
3. 24.
4. Directed complete graph.
5. Only 18.
6. 6, 10, 15 or 30.
7. There are $n - 1$ odd degrees $\implies n - 1$ is even, n is odd \implies one even degree in \overline{G} .
8. The number of edges between the vertices of degree ≤ 7 and the vertices of degree ≥ 16 is both ≤ 70 and $\geq 70 \implies = 70 \implies |E(G)| = 115$.
9. No: the number of edges between the vertices of degree 4 and 10 and the vertices of degree 16 is both ≤ 66 and ≥ 72 , a contradiction.
10. There are 11 of them.
11. There are 2 of them.
12. a) There are 4 such graphs,
b) there are 4 such graphs,
c) there are 2 such graphs.
13. a) Yes, yes, no (should have 15/2 edges).
b) No (should have 11 vertices and 55/2 edges).
14. a) no, b) yes.
15. a) and b) are isomorphic, and c) is not isomorphic to them.
16. a) and b) are isomorphic to it, c) is not.
17. No. The underlying graph is a cycle, and the knights cannot change their order on it.