

► **Problem 9.2-18(b)(f)(g)(h)**

For each of the following sequence, determine if there exists a graph whose degree sequence is the one specified. In each case, either draw a graph or explain why no graph exists.

(b) 100, 99, 98, . . . , 3, 2, 2, 2

(f) 5, 4, 3, 2, 1, 1

(g) 6, 6, 4, 2, 2, 2, 1, 1

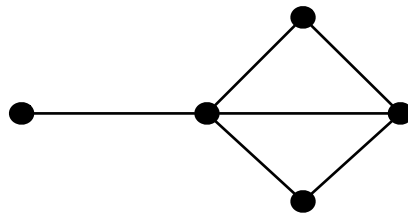
(h) 4, 3, 2, 2, 1

Solution. (b) No such graph exists because $2 + 2 + 2 + 3 + 4 + \cdots + 100 = 3 + \sum_{k=1}^{100} k = 3 + \frac{100 \cdot 101}{2}$ is odd.

(f) No such graph exists because the vertex of degree 5 would be adjacent to all other vertices, but now, the two vertices of degree 1 have been accounted for, and it is not possible to have a vertex of degree 4.

(g) No such graph exists because the two vertices of degree 6 use up all the degrees 1, 1, 2, 2, 2, leaving a vertex of degree 4 impossible.

(h) The graph of degree sequence 4, 3, 2, 2, 1 is the following.



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