

§9.2#18

A priori, each vertex could have degree $0, 1, 2, \dots, n - 1$. However, if there is a vertex of degree $n - 1$, then that vertex must have an edge to every other vertex and thus there cannot be a vertex of degree 0. Thus, the possible degrees are either $1, 2, \dots, n - 1$ or $0, 1, 2, \dots, n - 2$. In either case, there are $n - 1$ possible degrees and n vertices so by the PHP, two vertices must be of the same degree.

§9.4#36

We did this in class. See notes.