1. Prove that a graph G is bipartite iff it contains no cycles of odd length.

a •————————• 1
b •————————• 2
c •
d •————————• 3
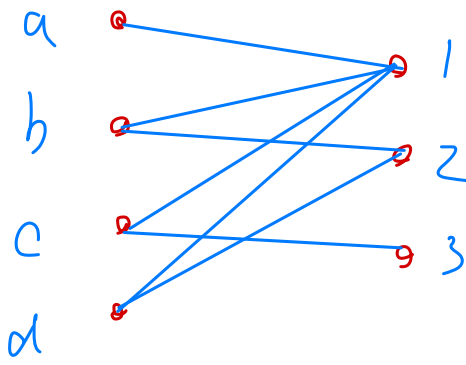
If we need to travel from d back to d, we must go to the right side then back to the left side. So, it can not be odd length.