

Math 451 - Spring 2018

Homework 5

Due March 8th, 2018

In mathematics you don't understand things. You just get used to them.

— John von Neumann

Turn in:

- (1) Exercise 4.39 (If you didn't turn it in on the last homework.)
- (2) Show that a tree with no vertex of degree 2, has more leaves than non-leaf vertices.
- (3) (a) Let G be any connected graph, and let e be any edge in G . Show that there is some spanning tree of G containing e . (Hint: Use Kruskal's algorithm!)
- (b) Let G be a connected graph. Show that G has a unique spanning tree if and only if G is a tree. Hint: For one direction of the proof, show that if G is not a tree, then it has more than one spanning tree.)