Worksheet # 3

MATH 294 ESP Workshop

Spring 2016

Start by drawing some finite number of dots on a sheet of paper. Two players take turns drawing either a curve connecting two dots or a curve connecting a dot to itself. The winner is the last player who can draw a curve while following the rules:

 (1) A dot may have at most three curves attached to it. A curve from a dot to itself counts as two.
 (2) No curve may touch or cross itself or any other curve.
 (3) When a curve is drawn a new dot is added somewhere on the curve.

Play a few rounds of this game.

Problem 1. Is the game guaranteed to end? Prove your answer.

Problem 2. Are there always the same number of moves for a given starting set of dots?

Problem 3. If the game starts with two dots is it better to be the first player or the second player? What about if the game starts with three dots?