Math3250 Combinatorics Reading HW 17

Instruction. Submit your homework by email (subject: Math3250 Combinatorics Reading HW 17). Use a scanner app to convert to PDF your handwritten work.

References:

- J. Scott, *Grassmannians and Cluster Algebras*
- A. Postnikov, *Total Positivity, Grassmannians, and Networks*

Video/Lecture notes

Either watch the lecture video of plabic graphs (53 minutes) on YouTube, or read the lecture notes lecture notes for plabic graphs.

Write down what you did. The video is at original speed — you can play the video at faster speed if you are not taking notes.

Exercises

1.) Prove Claim 1 (p. 2 of the lecture notes). If you cannot prove it in general, then please verify Claim 1 for trips starting at 1, 2, 3, 4, 5, and 6 of the plabic graph labeled D (p. 1 of the lecture notes).

2.) Prove the rest of Proposition 2 (p. 3 of the lecture notes): The trip permutation is preserved by a local move (M2) and (M3).

3.) Do the rest of Example 3 (p. 4 of the lecture notes): Compute the face labelings of the plabic graphs G_1, G_2, G_3, G_4.

4.) Do HW 4 (p. 5 of the lecture notes). Find a natural map from the set of five plabic graphs G_1, G_2, G_3, G_4, G_5 (on p. 4) to the set of five triangulations of a pentagon (p. 5).

Last Section

- Email me with a couple of the above exercises that you would like to show during class on Tue Apr 28.
- Questions, comments, suggestions?