Math 181: Practice
Matching
2/5/18

1. For the following graphs, either show a perfect matching, or explain why they do not have one.

![Graph (a)](image1)
![Graph (b)](image2)
![Graph (c)](image3)
![Graph (d)](image4)
![Graph (e)](image5)

2. For the following graphs, find (i) two different maximal matchings and (ii) a maximum matching. Is your maximum matching a perfect matching?

![Graph (a)](image6)
![Graph (b)](image7)
![Graph (c)](image8)

3. Place the cards from a deck into 13 rows of 4. We want to figure out if you can always find an Ace in one row, a Two from an unused row, a Three from an unused row, and so on up through King.

(a) Can you figure out how to model this situation with a bipartite graph? (Hint: each part will have 13 vertices.)

(b) Will your graph always have a perfect matching? Why or why not?