Matroids And their Graphs

o.mcdonnell4@nuigalway.ie

16 January 2018

Definition 0.1. If M is a matroid , then is there exists a bijection from the ground set of M_i to the ground set of M_j, such that a set is independent in the first matroid if and only if it is independent in the second matroid, then M_i and M_j are said to be isomorphic

Excercise: 2.4
Let E be a set, $\{1,2,3\}$ then
i) Show there are exactly eight non-isomorphic matroids on E. Along with the corresponding Graph of each matroid
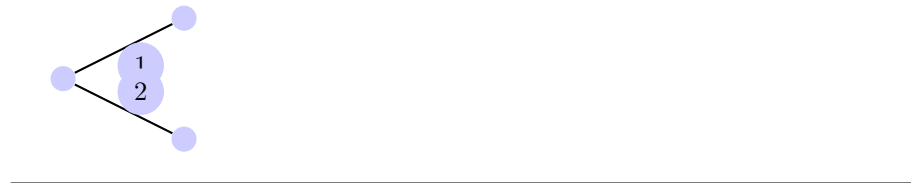**Solution:**

$$\{\emptyset\}$$

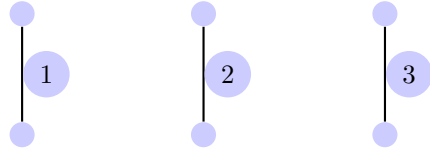$$\{\{\emptyset\},\{1\}\} \cong \{\{\emptyset\},\{2\}\} \cong \{\{\emptyset\},\{3\}\}$$

$$\{\{\emptyset\},\{1\},\{2\},\{1,2\}\} \cong \{\{\emptyset\},\{1\},\{3\},\{1,3\}\} \cong \{\{\emptyset\},\{2\},\{3\},\{2,3\}\}$$
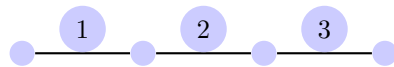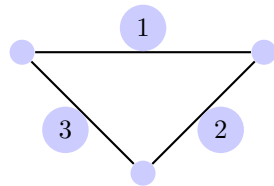

$$\{\{\emptyset\},\{1\},\{2\}\}$$

$$\{\{\emptyset\},\{1\},\{2\},\{3\}\}$$

$$\{\{\emptyset\},\{1\},\{2\},\{3\},\{1,2\},\{2,3\}\}$$

$$\{\{\emptyset\},\{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\}\}$$

$$\{\{\emptyset\},\{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\},\{1,2,3\}\}$$