1. Practice sheet for the lecture: **Felsner, Heldt**
Vorlesung über Graphentheorie/ Graphtheory (DS II) 18. Oktober
`http://page.math.tu-berlin.de/~felsner/Lehre/dsII11.html`

(1)

(a) Prove, that there is no homomorphism, mapping an odd cycle to a path.

(b) Which choices of m, n, k support homomorphisms from $K_{m,n}$ to K_k?

(c) Which choices of k, n support homomorphisms from C_k to K_n?

(d) Is there a homomorphism from the Peterson graph to C_5? Is there a homomorphism from the Peterson graph to $K_3 = C_3$?

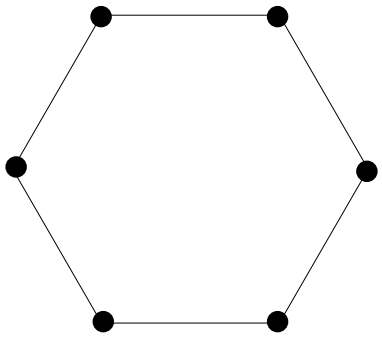
(2) A *k-regular graph* is a graph, such that all vertices have degree k (i.e. are adjacent to k other vertices). How many 3-regular graphs with 1,2,3,...,7(,8) vertices are there?

(3)

(a) Do graphs with strictly monoton degree sequences exist?

(b) How many graphs are there, having the degree sequence $(3, 2, 2, 2, 1)$? How many graphs are there, which have the degree sequence $(3, 2, 2, 2, 2, 2, 1)$?

(4) Find a representation of C_6 (the circle of length 6) as a thrackle.



(a representation of C_6 which is not a thrackle)