Exercise 1

Look up Tutte's Theorem: 3.11 on page 16. Show an explicit construction for the complete bipartite graph $K_{3,n}$.

. . . .

Exercise 2 (3.1)

Let G be a graph which is not a forest (has at least one cycle). Prove that

$$g(G) \leq 2 \operatorname{diam} G + 1.$$

. . . .

Exercise 3 (3.3)

Let $r \geq 3$, $m \geq 3$ and let $\alpha_1, \ldots, \alpha_m$ be nonnegative integers. Prove that there exists an r-regular graph containing exactly α_i cycles of length i, $3 \leq i \leq m$.

. . . .