All questions refer to the local connection game.

Exercise 14:
In Lemma 4.1, we saw that the complete graph is an optimal solution for $\alpha \leq 2$, and the star is an optimal solution for $\alpha \geq 2$. Prove that if $\alpha \neq 2$, then these graphs are in fact the only optimal solutions.

Exercise 15:
Give a complete characterisation of all optimal networks for $\alpha = 2$.

Exercise 16:
Consider a path of $n$ nodes.

(a) Show that if $n = 5$ this graph is a Nash equilibrium for $\alpha = 2$.

(b) Show that for $n \geq 6$ this graph is not a Nash equilibrium for any $\alpha$. 