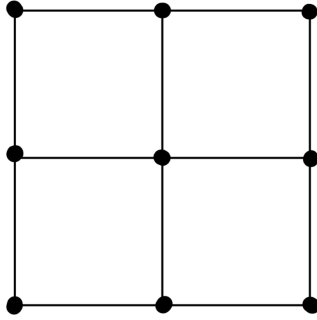




**Exercise 3 (20 pts)**

Determine a maximum matching in the following graph, and give a short proof that your answer is correct.



**Exercise 4 (30 pts).**

Let  $G$  be a cycle.

a) Show that

$$\chi(G) = \begin{cases} 2 & \text{if } v(G) \text{ is even,} \\ 3 & \text{if } v(G) \text{ is odd.} \end{cases}$$

b) Show that  $\chi_\ell(G) = \chi(G)$ .

(The end)