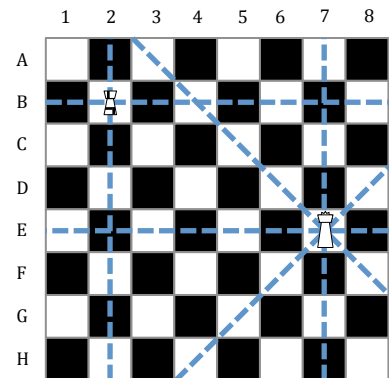


**Given name:**   
**Family name:**   
**Id. number:**

1. Recalling that a chess queen (as the one in E7 in the figure) can threaten another piece that lies on the same row, column or diagonal, formulate as 01 LP the problem of determining the largest possible number of queens that one can place on an 8x8 chessboard with no reciprocal check.
2. Modify the formulation of the previous problem considering the simultaneous presence of towers (as the piece in B2) and queens. Assuming a tower worth 3 and a queen 5, formulate the problem of maximizing the total score one can get by choosing the pieces and placing them on the chessboard with no reciprocal check.



*Hint:* imagine a graph with  $64 \cdot 2 = 128$  vertices and link by an edge those associated with pieces whose positions cause a reciprocal check.

3. Using a property of the cycles of the graph  $G$  drawn down here, describe and apply an algorithm to compute the cardinality  $\tau(G)$  of the smallest transversal set in  $G$ .

