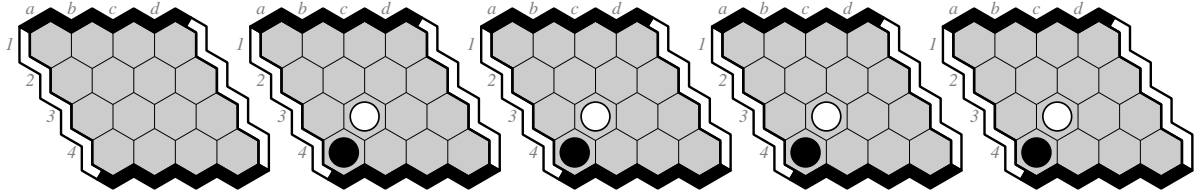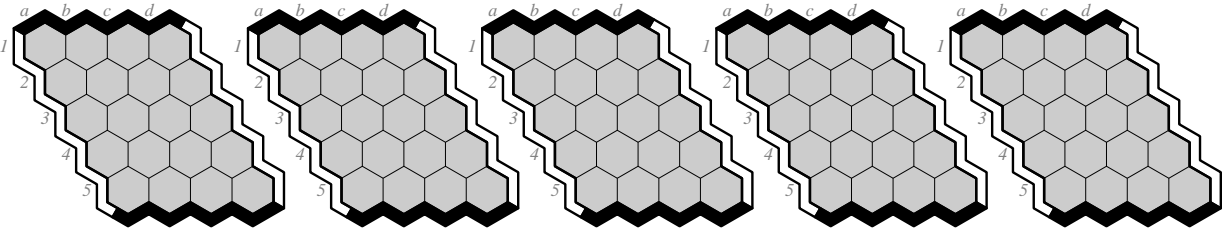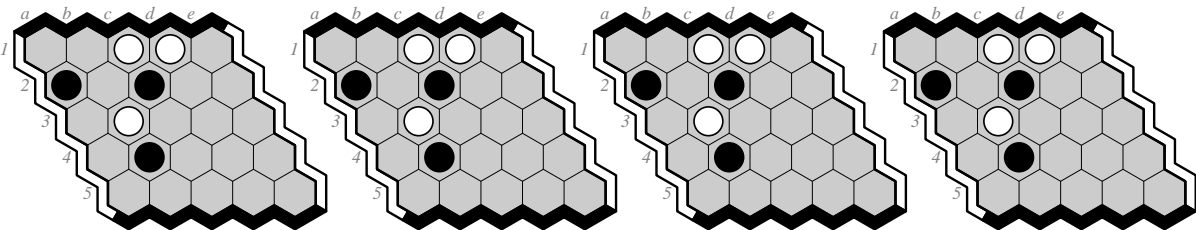## solving hex states: exercises

1. i) For 4x4 hex, show that the center opening wins.   ii) For the puzzle, who wins? Find all best moves.
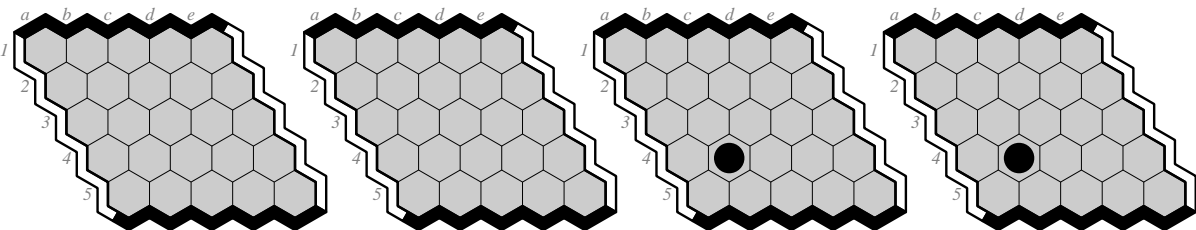
2. For 5x4 hex (5 rows, 4 columns, first player black, black connects top-to-bottom), find all winning opening moves.
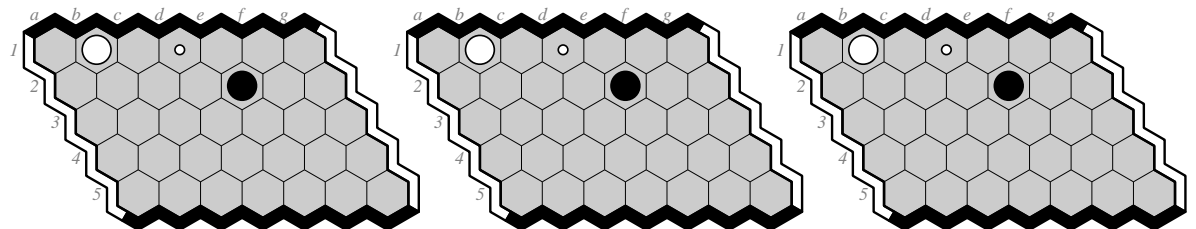
3. i) black to play: find all winning moves.   ii) Repeat for white.

4. For 5x5 hex, i) show that the center opening wins   ii) assume black opens at b4: find a 7-cell white mustplay region.
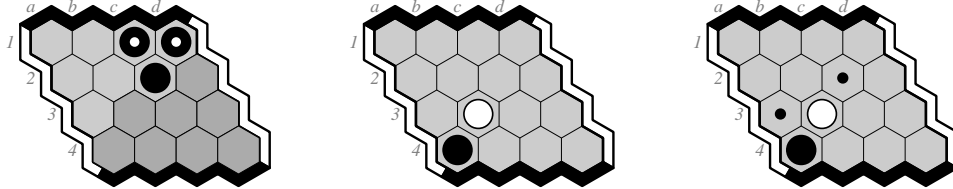
5. i) Find a white virtual connection between the white dot and the left side.   ii) Find a black top-to-bottom virtual connection.

Hints.

1. i) after black c2, black has a virtual connection (432 to bottom, captured pair to top)

   ii) as far as we know, all openings on the main diagonal win. so black wins here.

2. there are none. white has the shorter distance to travel, so the pairing strategy for irregular boards gives white a win, even though white plays 2nd.

3.

4. i) the vc is easy to see: combine a 432 to top with a 432 to bottom.

   ii) this semi-connection starts with black playing c2: then there are three bridges. so on white's next move, if white does not play one of these 7 cells, black plays c2 and wins.
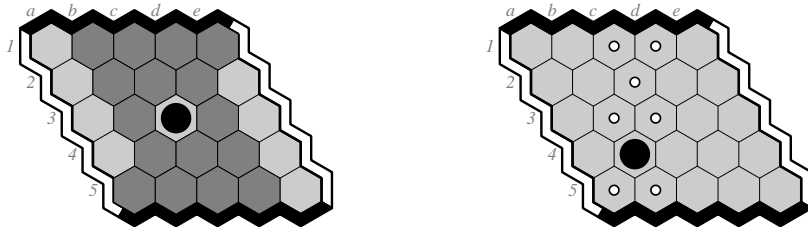
5. These are two well known side connections, the 4321 and the 7652.