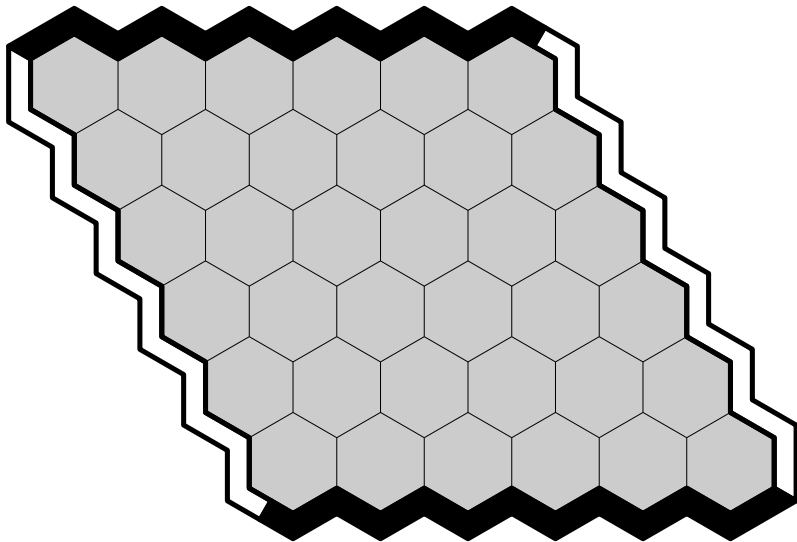


# game of hex – two books, one puzzle

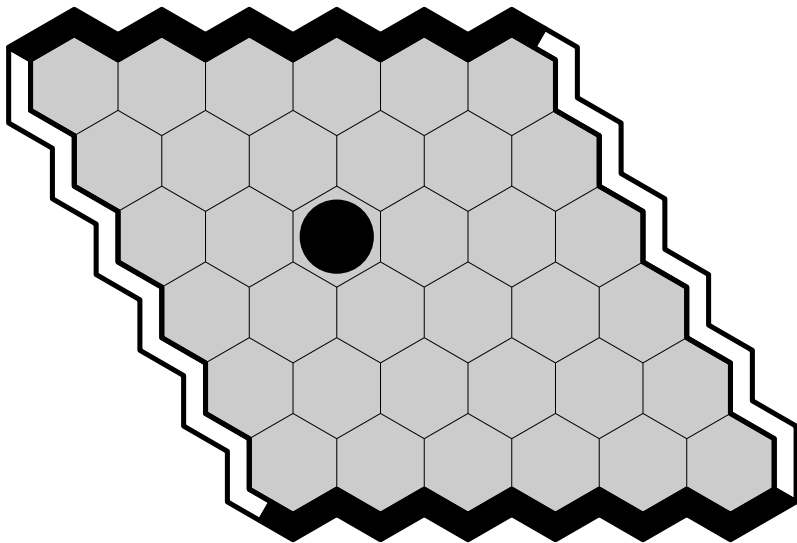
email [hayward@ualberta.ca](mailto:hayward@ualberta.ca)

G4G14 2022

# game of hex

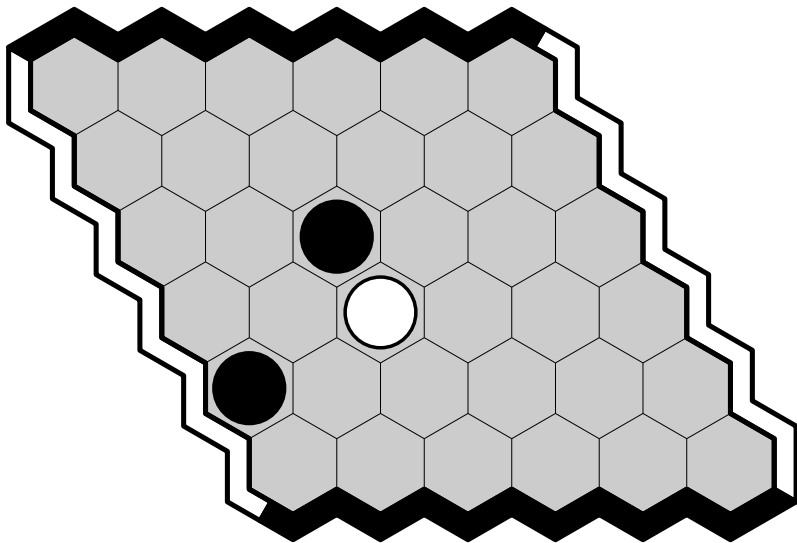


# game of hex

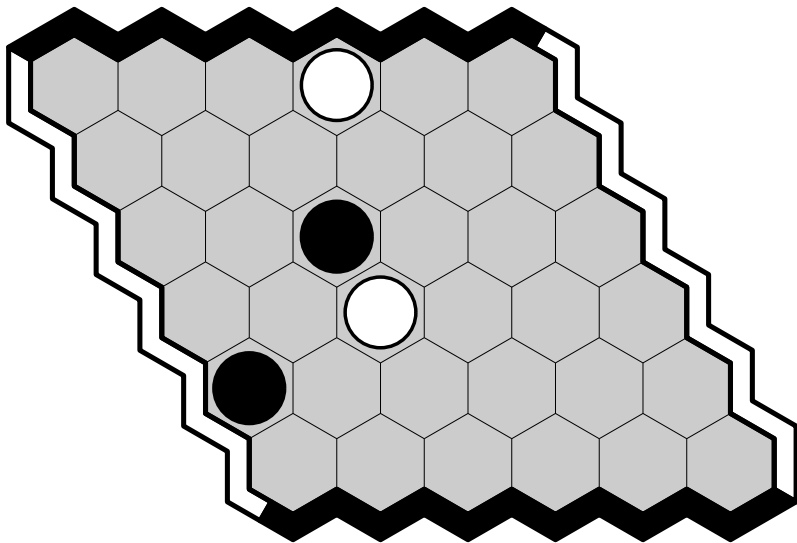




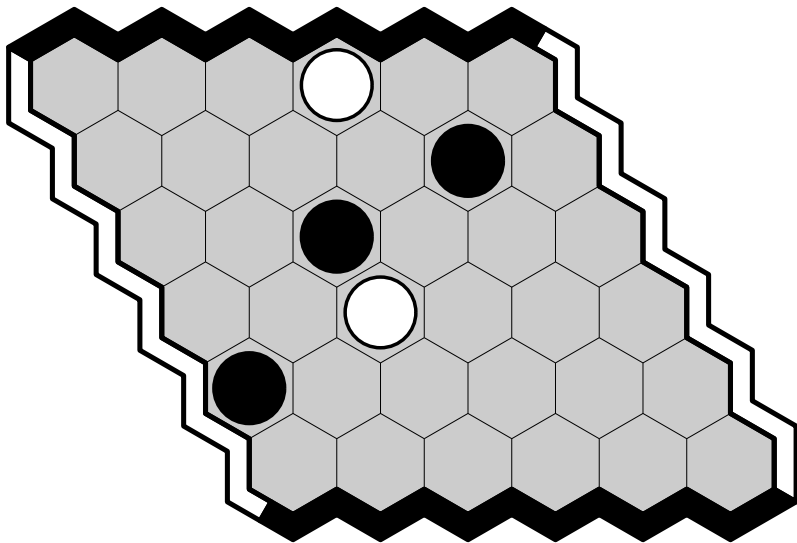
# game of hex



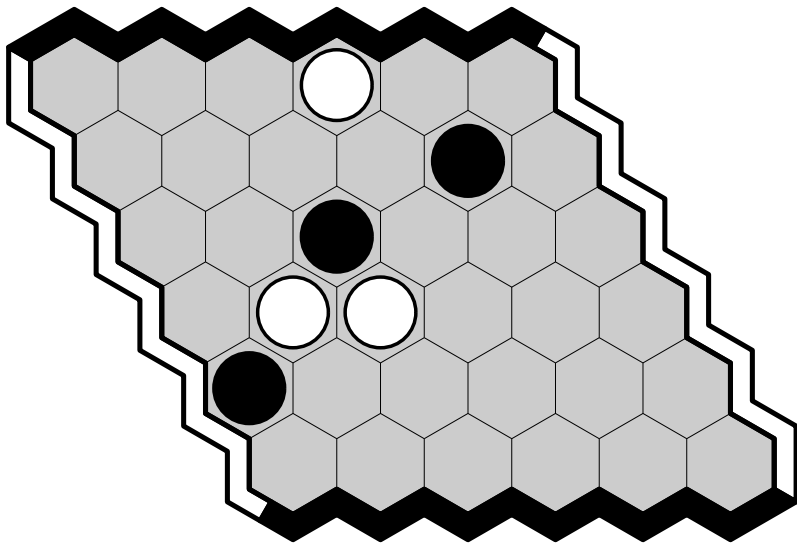
# game of hex



# game of hex

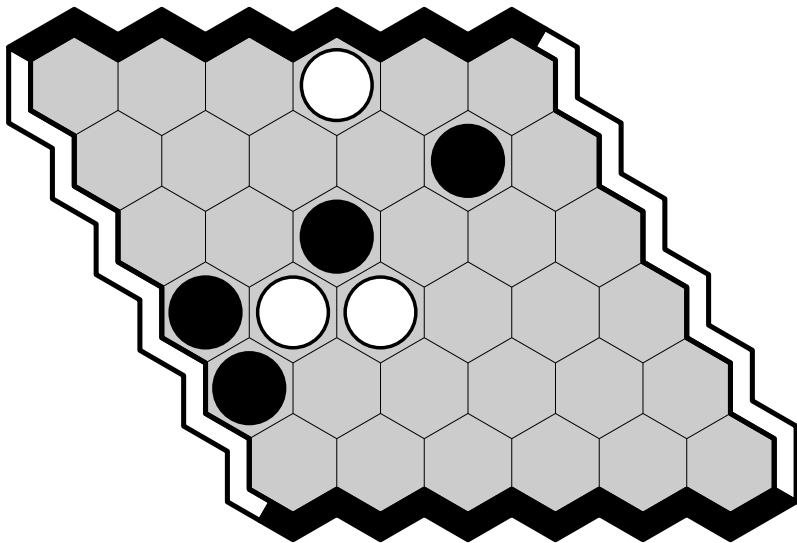


# game of hex



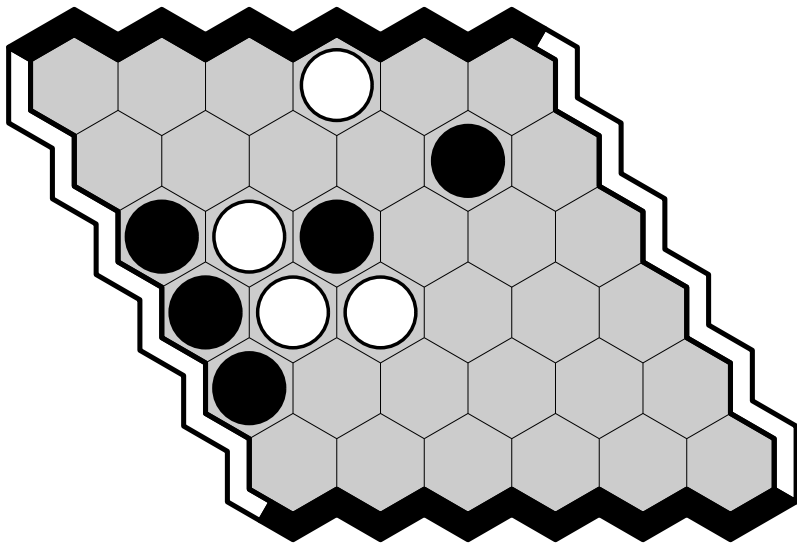


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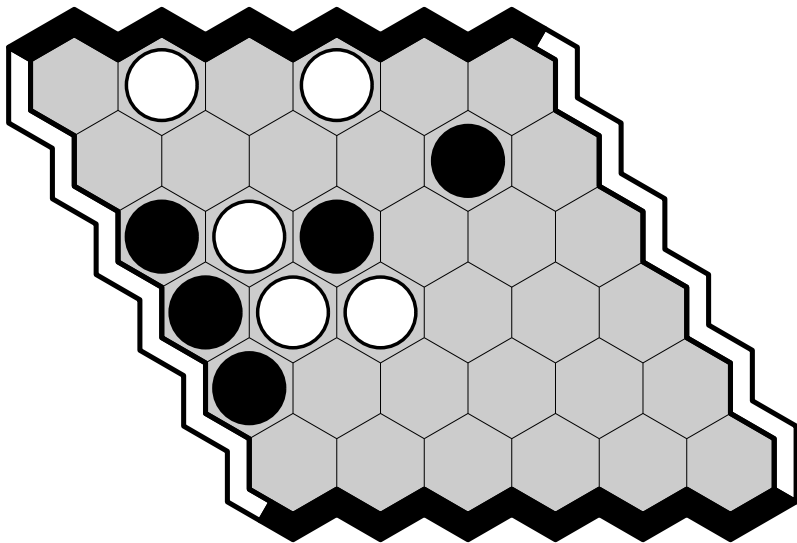




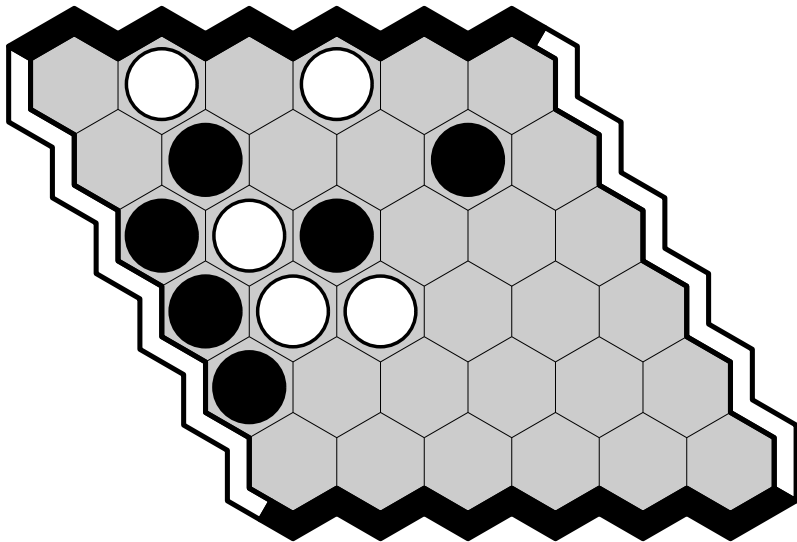
# game of hex



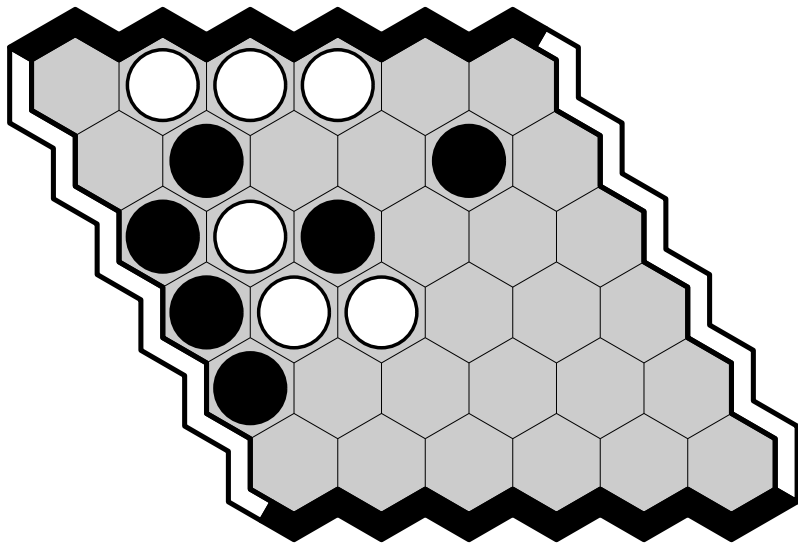
# game of hex



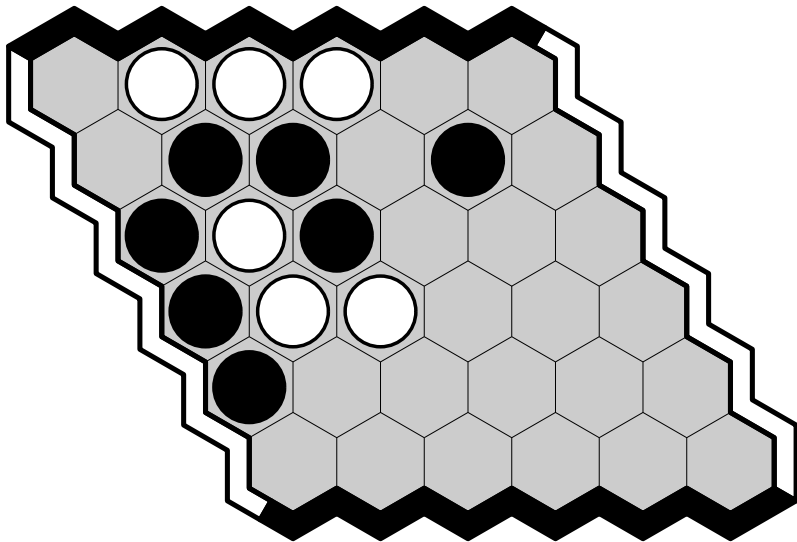
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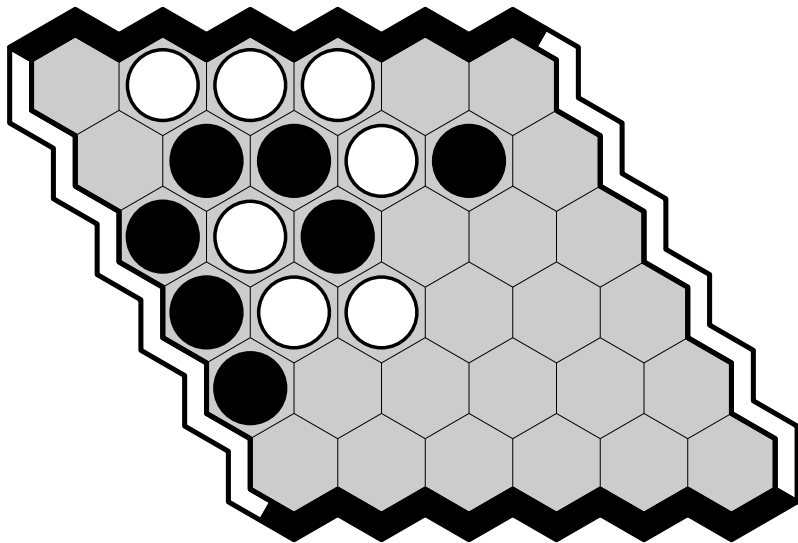
# game of hex



# game of hex

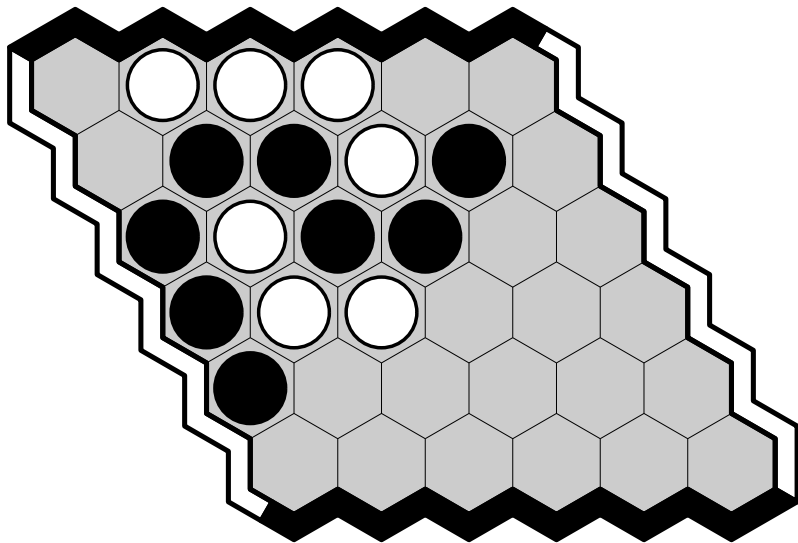


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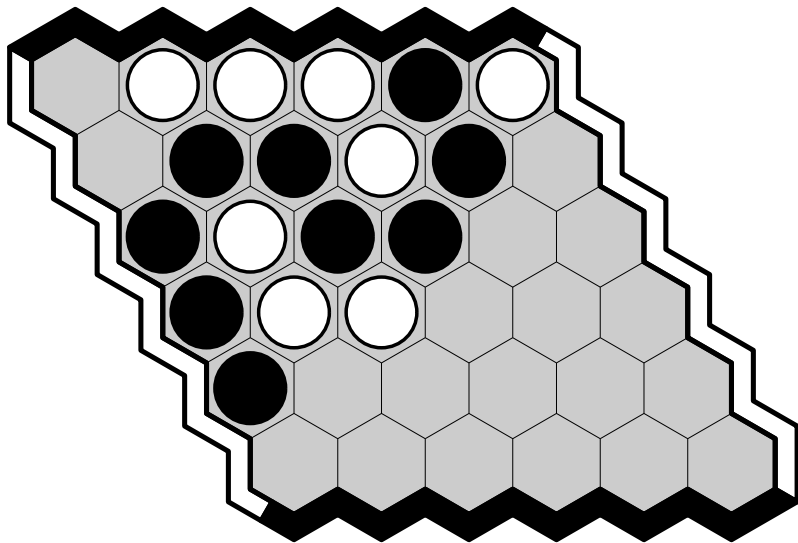


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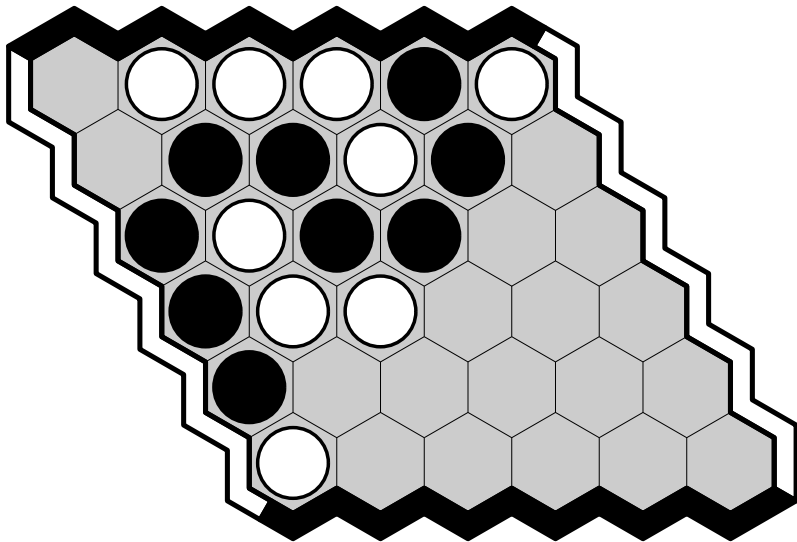




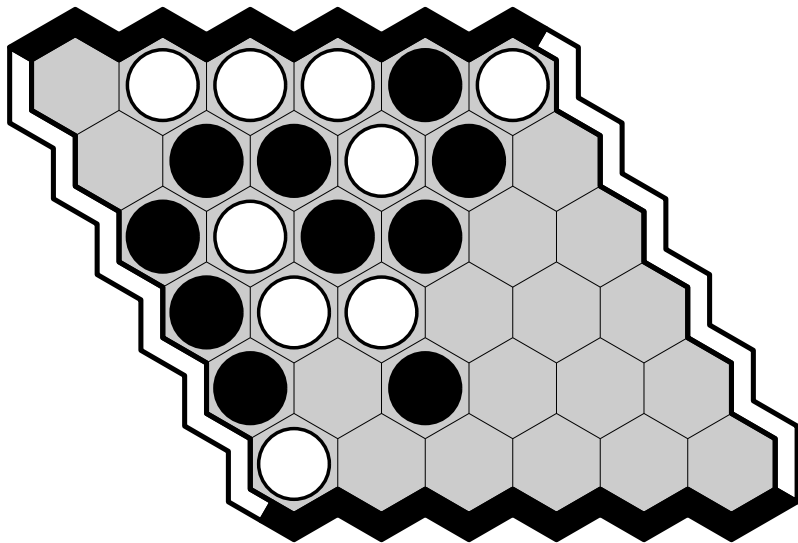
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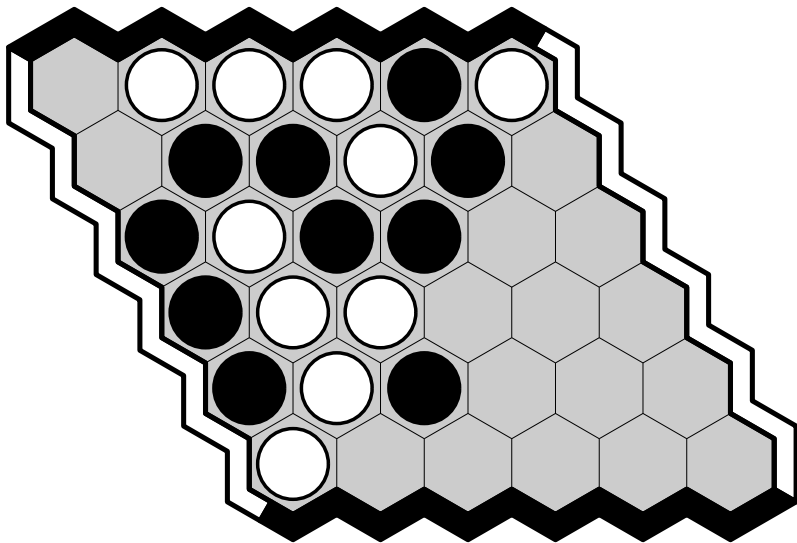
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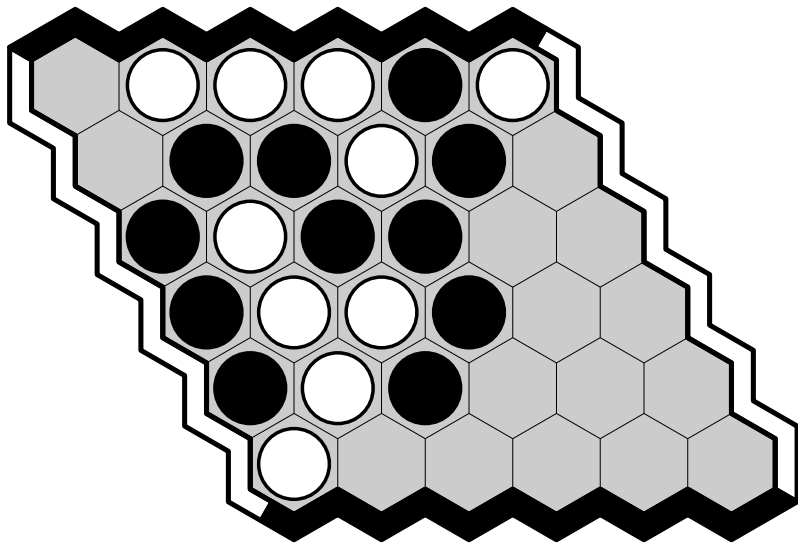
# game of hex



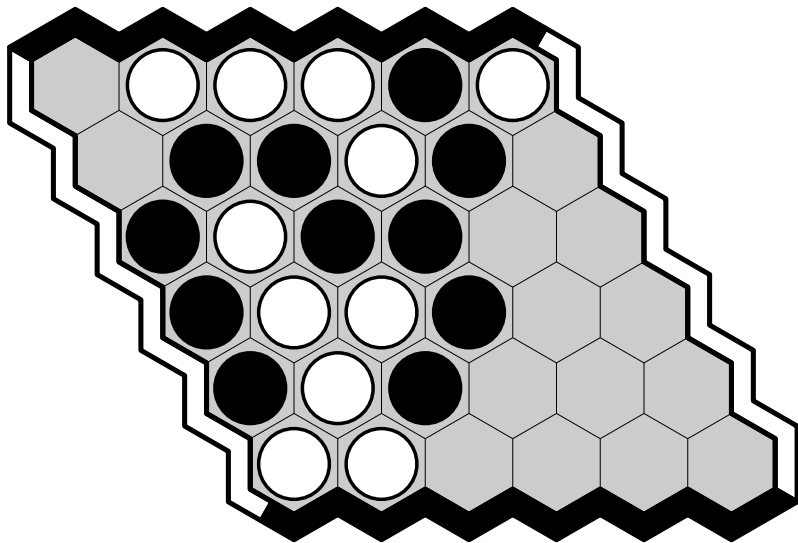
# game of hex



# game of hex

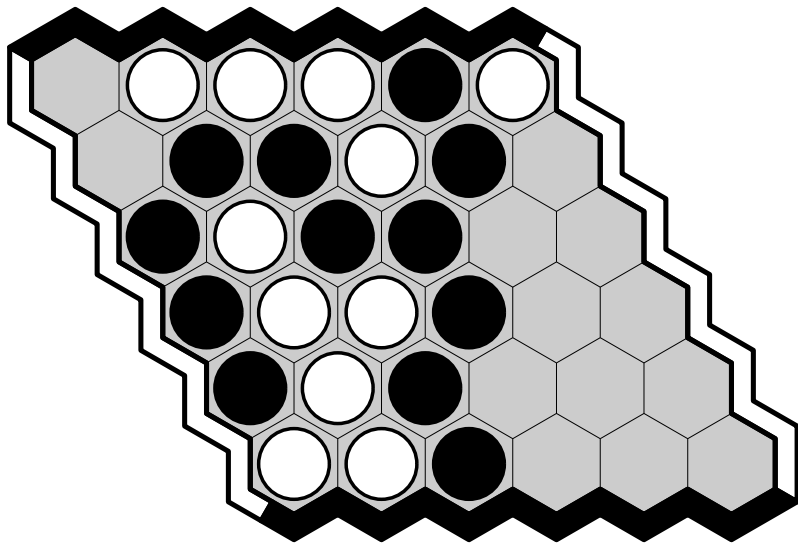


# game of hex





# game of hex



JULY ~~1957~~ 1957 Vol 197 #1 145-150

PLUS REPLIES/SOC'NS

## MATHEMATICAL GAMES

*Concerning the game of Hex, which may be played on the tiles of the bathroom floor*

by Martin Gardner

It is something of an occasion these days when someone invents a mathematical game that is both new and interesting. Such a game is Hex, introduced 15 years ago at Niels Bohr's Institute for Theoretical Physics in Copenhagen. Hex may well become one of the most widely played and thoughtfully analyzed new mathematical games of the century. It swept the Scandinavian countries in the middle 1940s, and in 1949 it was taken up by game theorists in the U. S. Later Claude E. Shannon and Edward F. Moore of the Bell Telephone Laboratories designed and built an analogue computer capable of playing a moderately good game of Hex.

Hex is played on a diamond-shaped board made up of hexagons (see illustra-

supply of white pieces. The players alternately place one of their pieces on any one of the hexagons, provided the hexagon is not already occupied by another piece. The objective of "black" is to complete an unbroken chain of black pieces between the two sides labeled "black." "White" tries to complete a similar chain of white pieces between the sides labeled "white."

The chain may freely twist and turn; an example of a winning chain is shown in the illustration at the bottom of the page. The players continue placing their pieces until one of them has made a complete chain. The game cannot end in a draw, because one player can block the other only by completing his own chain. These rules are simple, yet Hex is a game of surprising mathematical subtlety.

Hex was invented by Piet Hein, who must surely be one of the most remark-

Do you  
think about  
angular  
acceleration?



**CONVAIR**

Division of General Dynamics Corporation

does...

and uses Statham  
Angular Accelerometers  
to test...



# HEX

## The Full Story

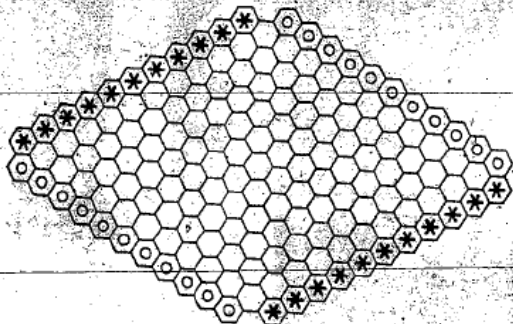
Ryan B. Hayward  
with Bjarne Toft



# Vil De lære Polygon?

Piet Hein har konstrueret et Spil, der med lige stor Glæde kan dyrkes af Skakesperten og den, der blot kan holde en Blyant

„Politiken“ udskriver i Dag en Præmieopgave, der vil volds Hovedbrud for Begyndere



Saaledes ser Polygon-Spilbrættet ud.

ten kan afbryde Forbindelsen ved at besætte det mellemste bode Felt. dens Anvendelighed beror paa Blykernes Placering i den vidtre Omegn. I det hele taget viser det sig snart nødvendigt at læge en stærk Del af Spillebrættet med Betragtning.

En anden Erfaring, som kommer senere, men som man kan læse Spillet's Begyndelse ved at røbe, er at det betaler sig at begynde i hvert Fald nogenlunde paa Midten. En rimelig, men paa ingen Maade nødvendig Aabning af Spillet er denne:

Paa Spillebrættet i Midten er Hvid begyndt i Midterfeltet. See her Sort sat i Kontaktfeltet til det ned imod Midten af Hvids Front og derved gjort to nyttige Felter, som staar i Vinkelstilling til Midterfeltet, usikre. Hvid har saa vaegt et Felt i Kontakt med sin første. Og nu svarer Sort med at besætte et Vinkelfelt, som vilde være meget nyttigt for Hvid. Hvor skal nu Hvid sætte? Der er forskellige gode Muligheder.

Saa dan er dette Spil nu begyndt. Nu kan enhver fortsætte. Det er altsaa Hvids Tur! Man skal ikke være udspekuleret fra Begyndelsen. Der er ingen bedre Vej til at lære Spillet end at spille læs.

Det er nyttigt at se skiftevis offensivt og defensivt paa Situationen, d. v. s. skiftevis paa sine egne og Modspillernes Muligheder, for at føre en Forbindelse igen-

# hex book one – history, 2019 CRC



photo credit wikipedia François Haffner

# hex book one – history, 2019 CRC

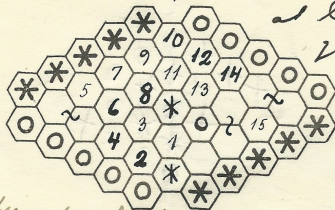


# POLYGON – SPILLEBRÆT

5 × 5

22. 1. 43.

Koen J.L.! En det meget vord,  
 som benyt det. Det er  
 jo ellers meget nok  
 at lave en lille  
 gennemanalyse



opgave!  
 F

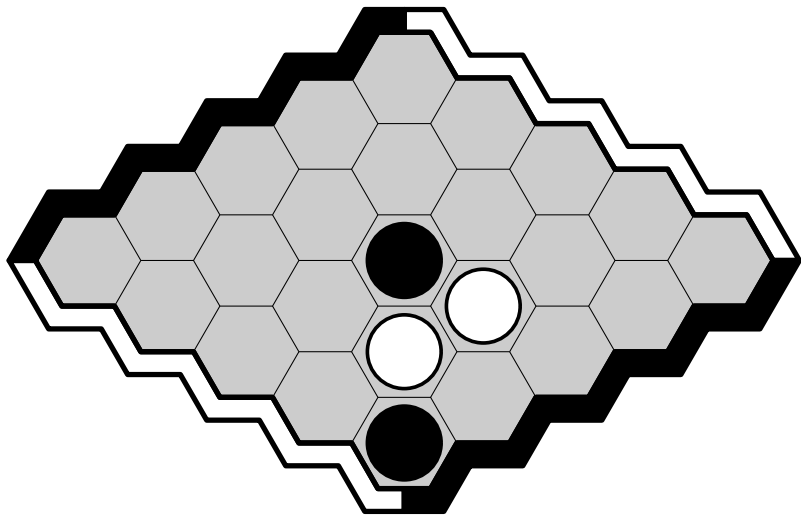
Denne opgave begynder lidt-og-omgøende, men først efter  
 15 Træk og under skadige Træk fra sorte Side.  
 Jeg har prøvet adskillige (men ikke alle!) andre Stø-  
 tigheder for hvids første Træk, men har kun fået  
 fundet et Modstrik fra sorte Side.

Venlig Hilsen. stud. mag. Klaus Thorsborg

<https://www.routledge.com/hex-Inside-and-Out->



# hex puzzle (based on Karen T) black to play



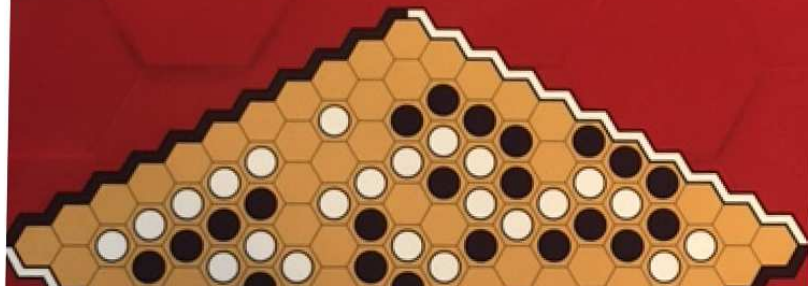
AMS / MAA

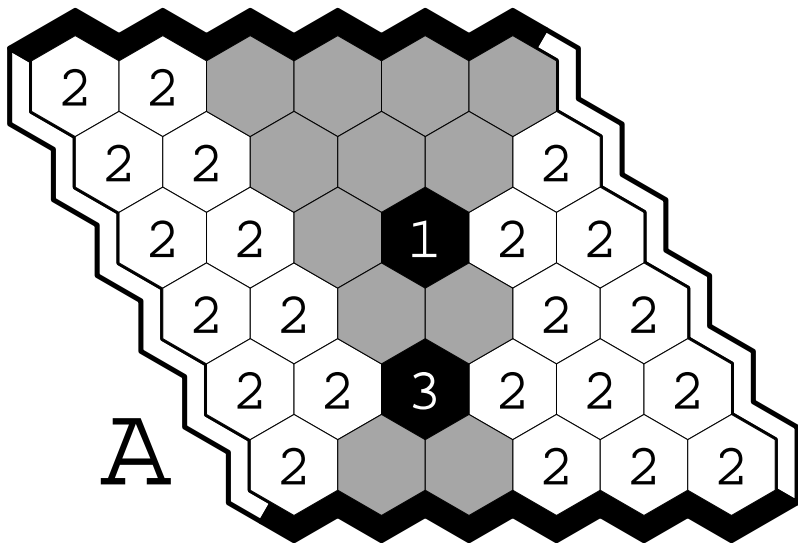
ANNELI LAX NEW MATHEMATICAL LIBRARY

VOL 54

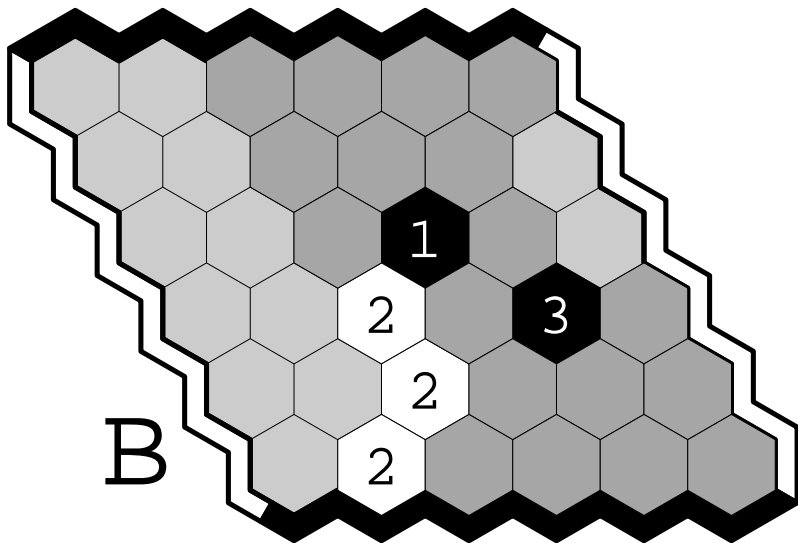
# Hex

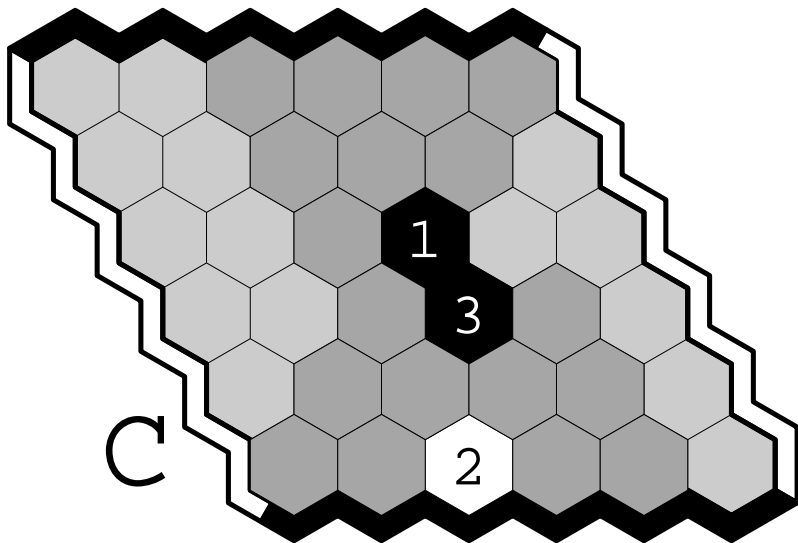
A Playful Introduction

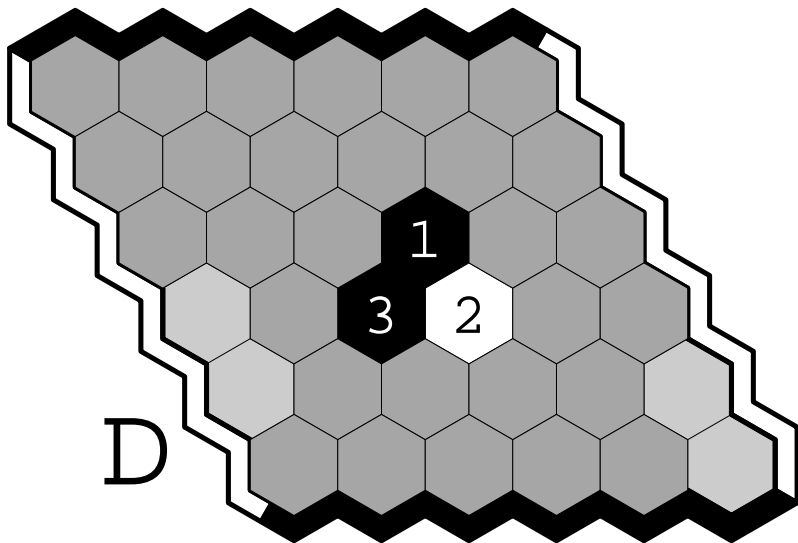


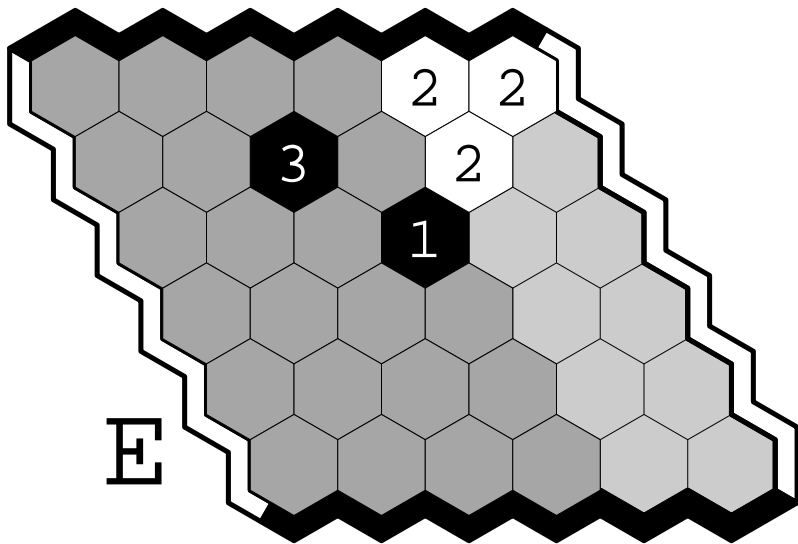


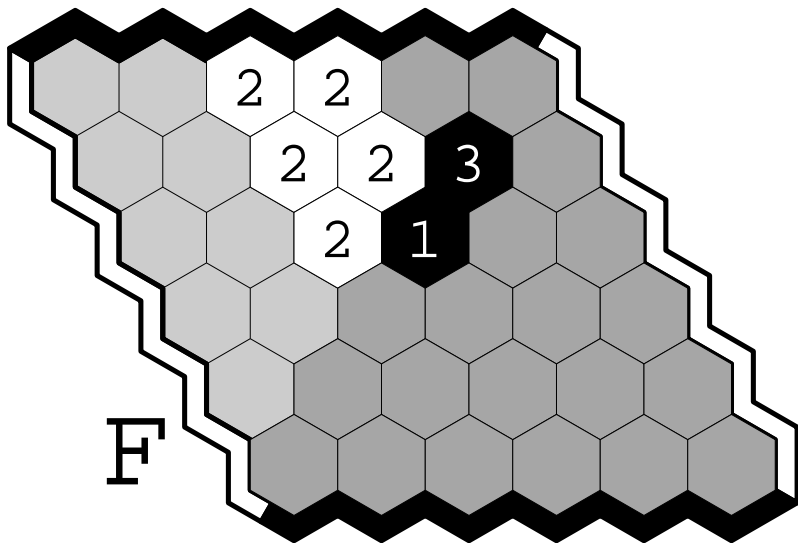
A









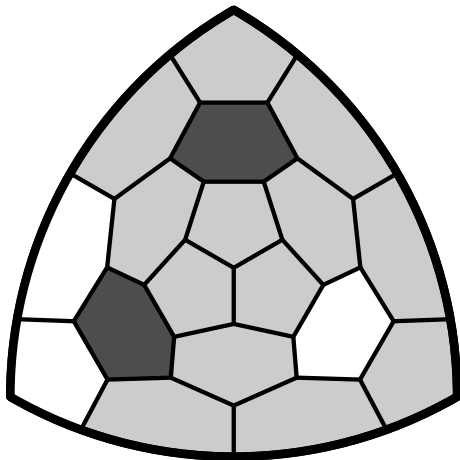


F



<https://bookstore.ams.org/nml-54/>

# bonus puzzle – black to play



Michael Johanson, Yngvi Björnsson, Morgan Kan,  
Nathan Po, Jack van Rijswijck, Broderick Arneson,  
Philip Henderson, Jakub Pawlewicz, Aja Huang  
(AlphaGo), Kenny Young, Noah Weninger, Chao  
Gao, Martin Müller, Bjarne Toft, Bedir Tapkan,  
Md-Reza Daliri, Peter Selinger, Eric Demer,  
Stephen Kennedy, Bob Hearn, Nancy Blachman

thank you

questions ?

email [hayward@ualberta.ca](mailto:hayward@ualberta.ca)

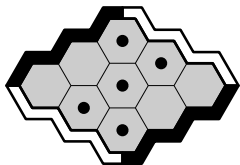
# WINNING 1ST-MOVES



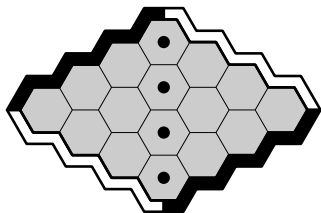
# WINNING 1ST-MOVES



# WINNING 1ST-MOVES

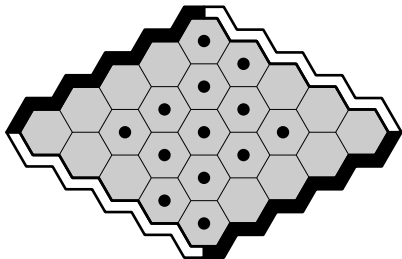


# WINNING 1ST-MOVES

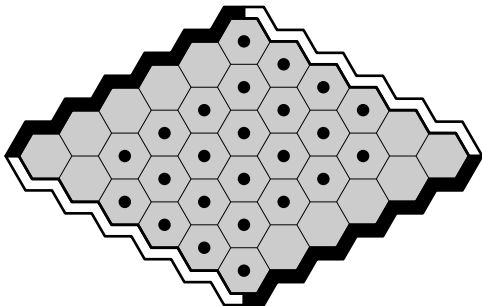


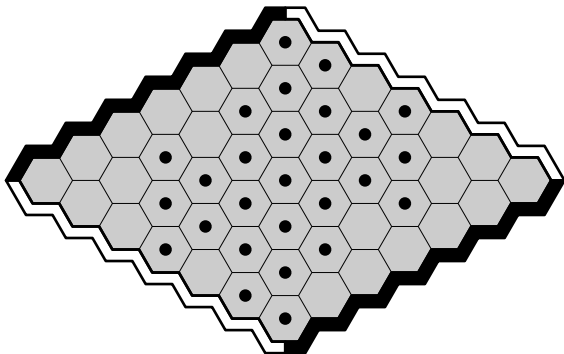


# WINNING 1ST-MOVES

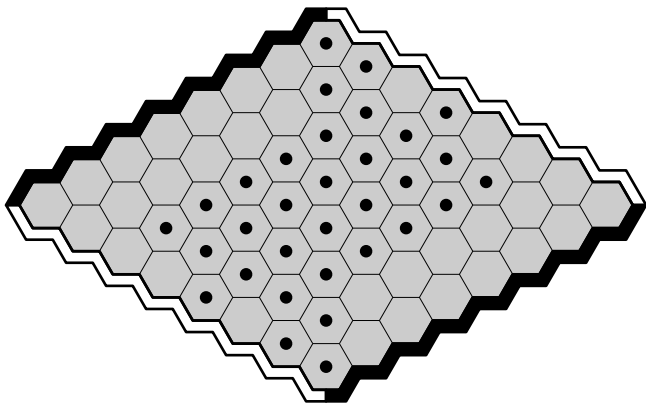


# WINNING 1ST-MOVES 1995 ENDERTON

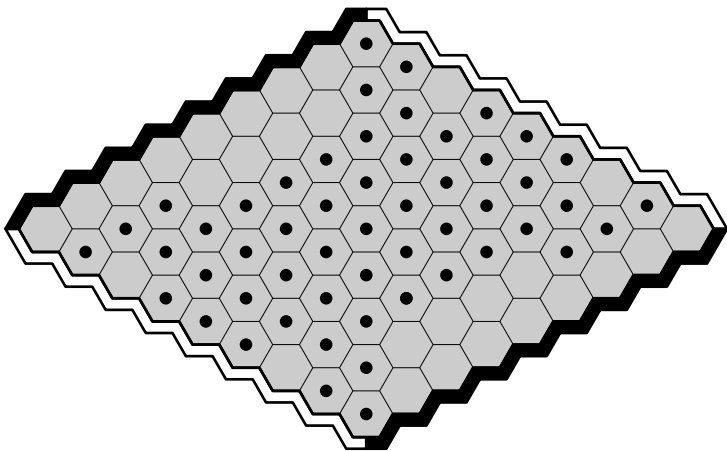




# WINNING 1ST-MOVES 2009 HAH



# WINNING 1ST-MOVES 2013 AHHP



# WINNING 1ST-MOVES 2014 PH

