1. In this Hex position, find all pairs $x, y$, both empty, such that $B$-coloring $x$ kills $y$.

2. Repeat 1) for $W$-coloring.

3. Consider any Hex position with $B$ to play, with $x, y$ as in 1), and with $y$ a winning $B$-move. Explain why $x$ is also a winning $B$-move.

4. Consider any Hex position with $B$ to play, with $x, y$ as in 2) (each is empty and $W$-coloring $x$ kills $y$) and with $y$ a winning $B$-move. Explain why there is some empty cell $z$ different from both $x, y$ such that $z$ is a winning $B$-move.

5. In the position, give the number of different winning $W$ moves.

6. Repeat 5) for $B$.

7. Recall: for a Hex position, a set $S$ is $B$-captured if $B$ has a second-player strategy on $S$ that leaves every cell in $S$ dead or $B$. For the position above:
   (i) why is $\{b4, c4\}$ $B$-captured?
   (ii) after a $B$-move at $c2$, why is $\{b3, c3, c4, d4\}$ is $B$-captured?
   (iii) when searching for a winning $B$-move, why can we ignore these sets? $\{b3, c3, c4, d4\}$ $\{a1, b1\}$ $\{d1\}$ $\{b2, a3\}$ (hints: mustplay, capture, dead)
   (iv) find all winning $B$ moves
   (v) find all winning $W$ moves

8. In your own words, explain briefly why there are no Hex $P$-positions (you don’t need to give a complete proof). Is the position above an $N$-position, $B$-position, or $W$-position?

9. Recall: 0 is the game $\{|\}$, $*$ is the game $\{0|0\}$, 1 is the game $\{0|\}$. Define $A$ as game $\{0|-1\}$, $B$ as game $\{0|-2\}$, $C$ as game $\{A, B | *\}$. For games, recall that $X \geq Y$ means that $X - Y$ is a P-position or an L-position.
   (i) Prove or disprove: $A \geq B$.
   (ii) When $L$ plays $C$, explain why $L$ prefers option $A$ to option $B$.
   (iii) Find the simplest game $D$ such that $C = D$. Justify briefly.