Homework 12

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1 Problem 18

1.1 Part b

Player 2 has the winning strategy. There exist values Player 2 can choose such that no matter what choices Player 1 chooses, Player 2 can make a winning move.

If Player 1 chooses $w = F$, they cannot pick $y = T$ because Player 2 can pick $z = T$, causing the 2nd clause to be false (going the way of C_2). If Player 1 chooses $w = T$, they cannot pick $y = F$ because Player 2 can pick $x = F$, causing the 3rd clause to be false (going the way of C_3).

If Player 1 chooses $w = F$ and $y = F$ (since the latter is forced), Player 2 can pick $x = F$ and $z = F$, causing the 1st clause to be false (going the way of C_1). If Player 1 chooses $w = T$ and $y = T$ (since the latter is forced), Player 2 can pick $x = F$ and $z = F$, causing the 1st clause to be false (going the way of C_1). Since all cases of values Player 1 picks leads to Player 2 winning, there does not exist values which Player 1 can play such that they will win. Therefore, Player 2 has the winning strategy in this game.