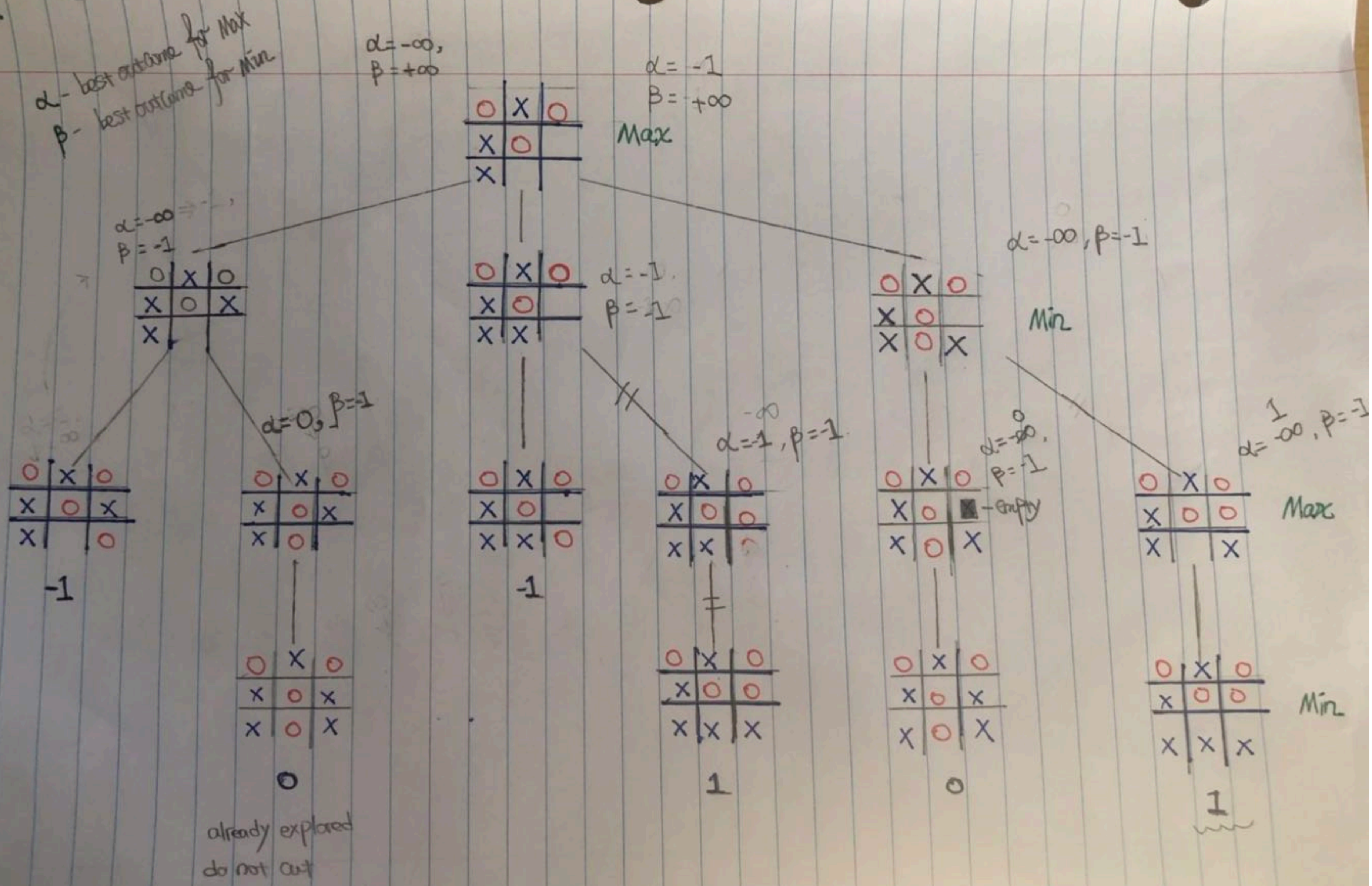
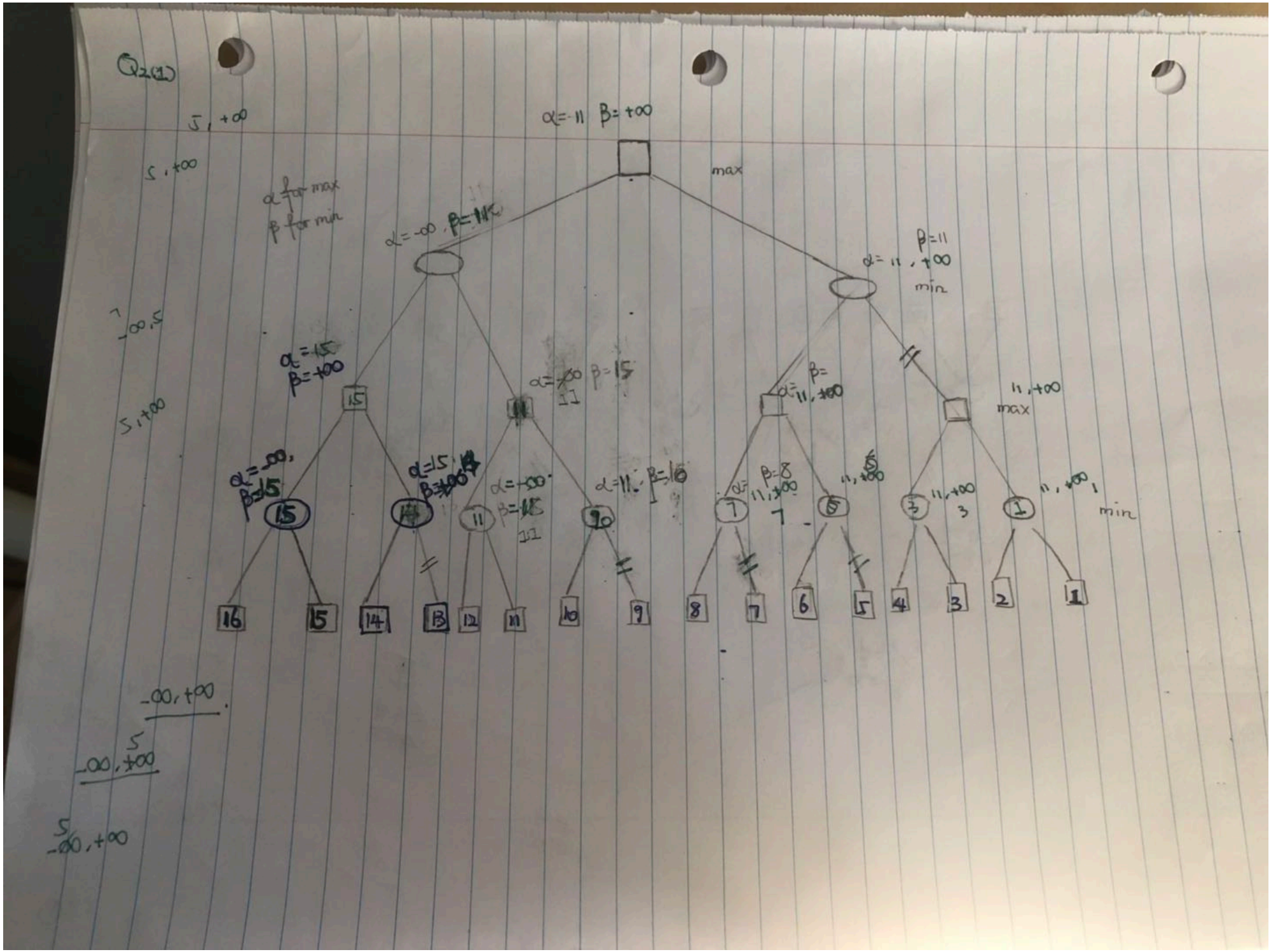
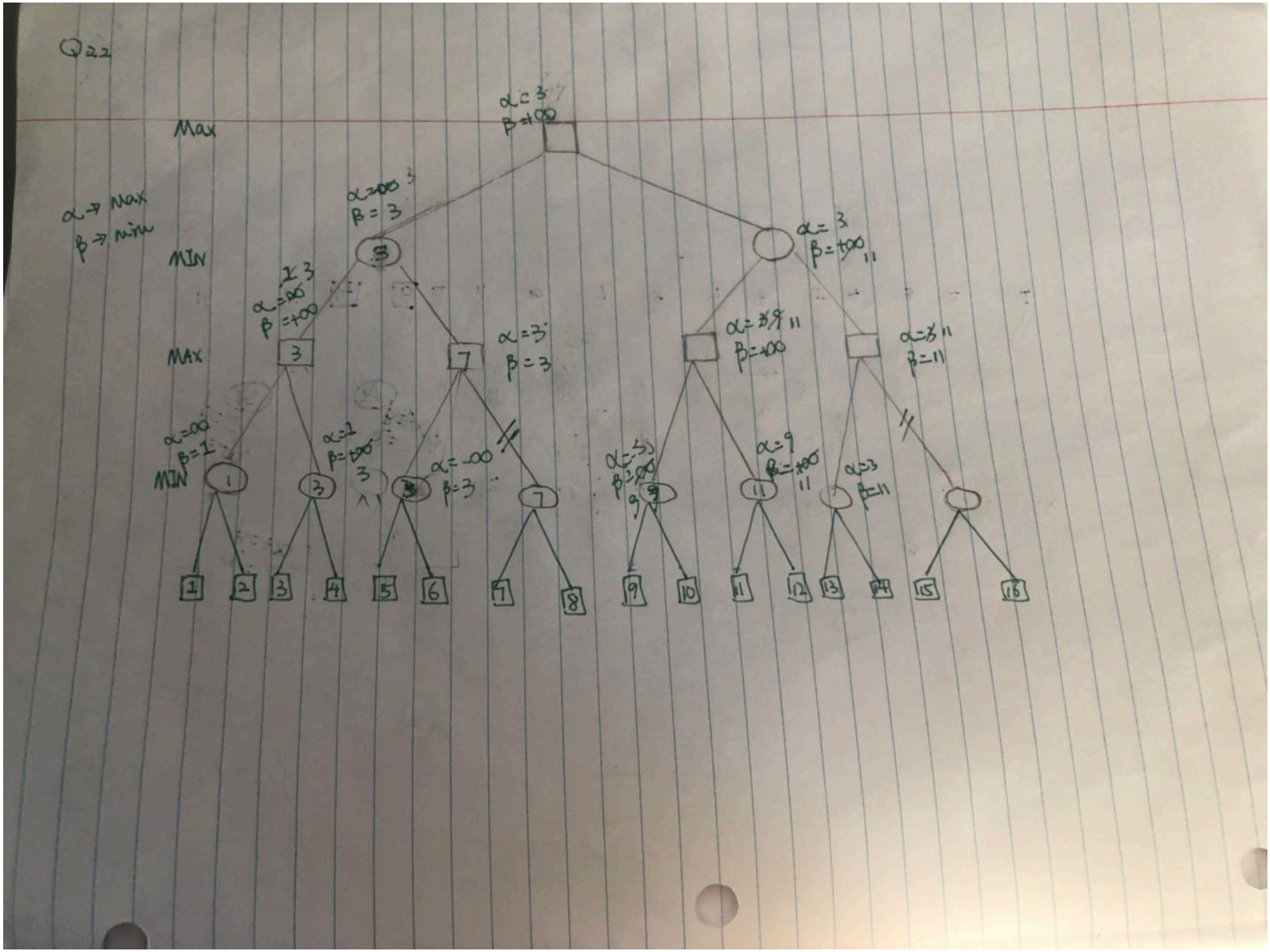
Q1.



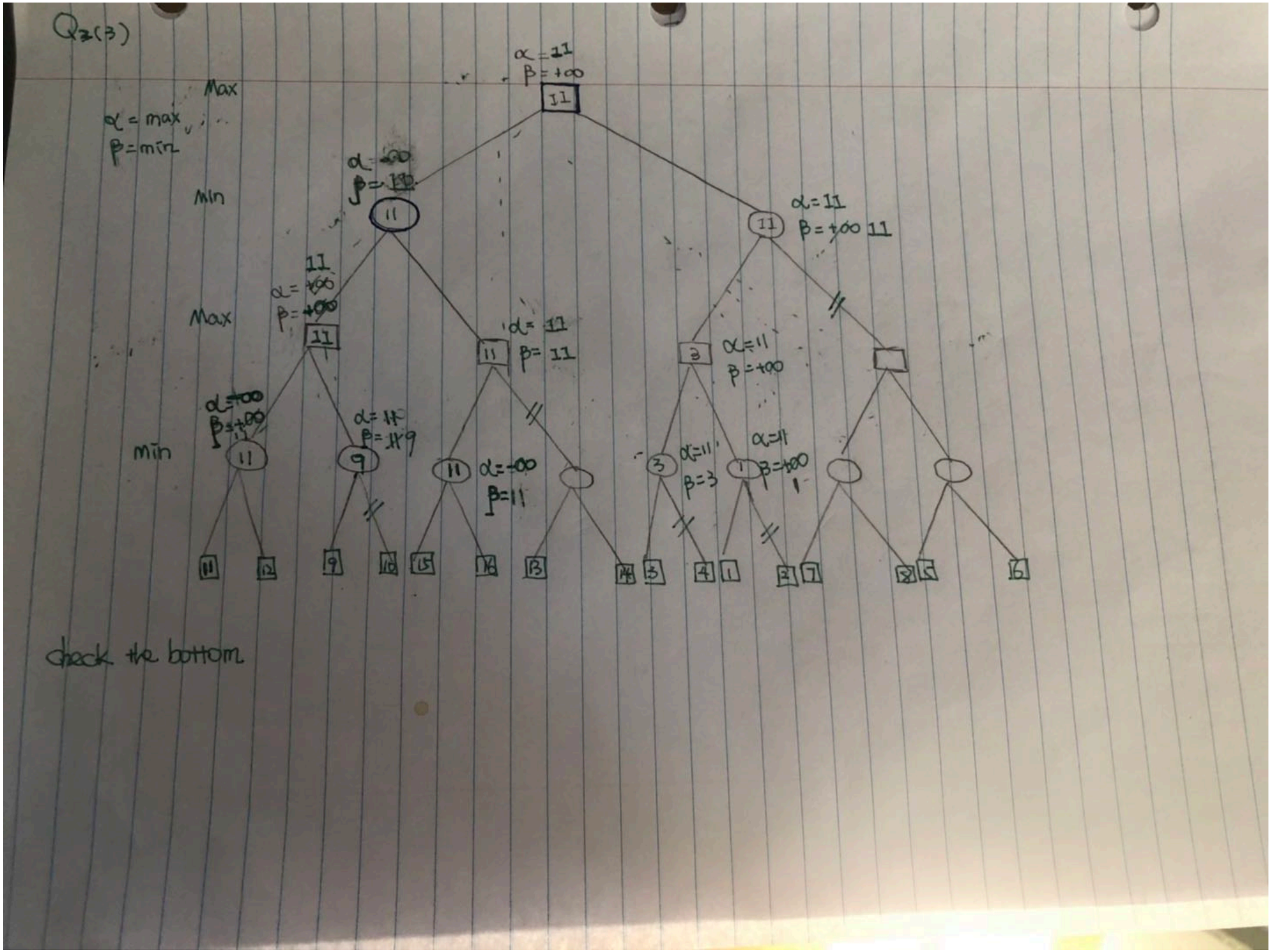
α - best outcome for Max
β - best outcome for Min
α = -∞,
β = +∞
α = -1
β = +∞
Max
α = -∞, β = -1
α = -1
β = -1
α = -∞, β = -1
Min
α = 0, β = -1
α = -1, β = -1
α = -∞,
β = -1
empty
α = -∞, β = -1
Max
-1
-1
0
1
0
1
Min
already explored
do not cut


Q2(1)
α for max
β for min
max
min
max
min
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

Q22


Max
MIN
Max
MIN
α → Max
β → Min
α=3
β=+∞
α=∞ 3
β=3
α=3
β=+∞ 11
α=∞ 3
β=+∞
α=3
β=3
α=3 11
β=+∞
α=3 11
β=11
α=∞
β=1
α=1
β=+∞ 3
α=-∞
β=3
α=-∞
β=5 9
α=9
β=+∞ 11
α=3
β=11
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Q3(3)

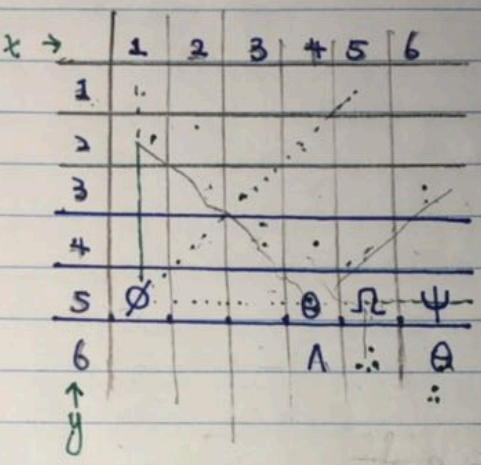


check the bottom

Q3.

	T	L	B	C	S	P	N
	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)
Mrv(T=1)		↑					↑
Fc(N,L)	1	(2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(1,2,3,4)	(2,3,4)
Mrv, D(N=2)							
Fc(L,B,C,P)	1	(3,4)	(1,3,4)	(1,3,4)	(1,2,3,4)	(1,3,4)	2
		↑	↑	↑		↑	
Mrv(L=3)							
Fc(C,P)	1	3	(1,3,4)	(1,4)	(1,2,3,4)	(1,4)	2
Mrv(C=4)						✗ ↓ check	
Fc(B)	1	3	(1,3)	4	(1,2,3,4)	[1]	2
Mrv Dp=1	1	3	(1,3)	4	(2,3,4)	1	2
Fc=S,							
Mrv B=1	1	3	1	4	(2,3,4)	1	1
S=2	1	3	1	4	2	1	1

Q4.



Variables:

$\{(x,y) : x,y \in \{1,2,\dots,6\}\}$

Domain:

$\{\emptyset, \Theta, \pi, \Omega, \Lambda, \Psi\}$

Constraints:

All Diff ($X_{11}, X_{12}, X_{13}, \dots, X_{16}$)

⋮

All Diff ($X_{61}, X_{62}, X_{63}, \dots, X_{66}$)

All Diff ($X_{11}, X_{21}, X_{31} \cdots, X_{61}$)

⋮

All Diff ($X_{16}, X_{26}, X_{36} \cdots X_{66}$)

Dom $X_{15} = \{\emptyset\}$

All Diff (X_{24} X_{33} X_{42} X_{51}) ✗ diagonal

All Diff ($X_{15}, X_{25}, X_{35}, X_{45}, X_{55}, X_{65}$) row

All Diff ($X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}$) col

Dom $X_{45} = \{\Theta\}$

All Diff ($X_{34}, X_{35}, X_{36}, X_{45}$ X_{56}) ($X_{11}, X_{22}, X_{33}, X_{44}, X_{55}, X_{66}$) diagonal

All Diff ($X_{41}, X_{42}, X_{43}, X_{44}, X_{45}, X_{46}$) ($X_{61}, X_{62}, X_{63}, X_{64}$ X_{65} X_{66})

All Diff ($X_{15}, X_{25}, X_{35}, X_{45}, X_{55}, X_{65}$) ($X_{16}, X_{26}, X_{36}, X_{46}, X_{56}, X_{66}$)

Dom $X_{55} = \{\Omega\}$

All Diff ($X_{66}, X_{55}, X_{44}, X_{33}, X_{22}$) ✗ X_{11}

All Diff ($X_{51 \to 6}$) col

All Diff ($X_{1-6,5}$) row

Dom $X_{4,6} = \{\Lambda\}$

All Diff ($X_{55}, X_{64}, X_{35}, X_{24}, X_{13}$)

All Diff ($X_{4,1 \to 6}$)

All Diff ($X_{1 \to 6, 6}$)

Dom $X_{65} = \{\Psi\}$

All Diff ($X_{65}, X_{54}, X_{43}, X_{32}, X_{21}$)

All Diff ($X_{6,1 \to 6}$) All Diff ($X_{1-6,5}$)