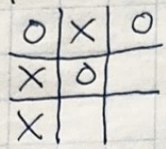
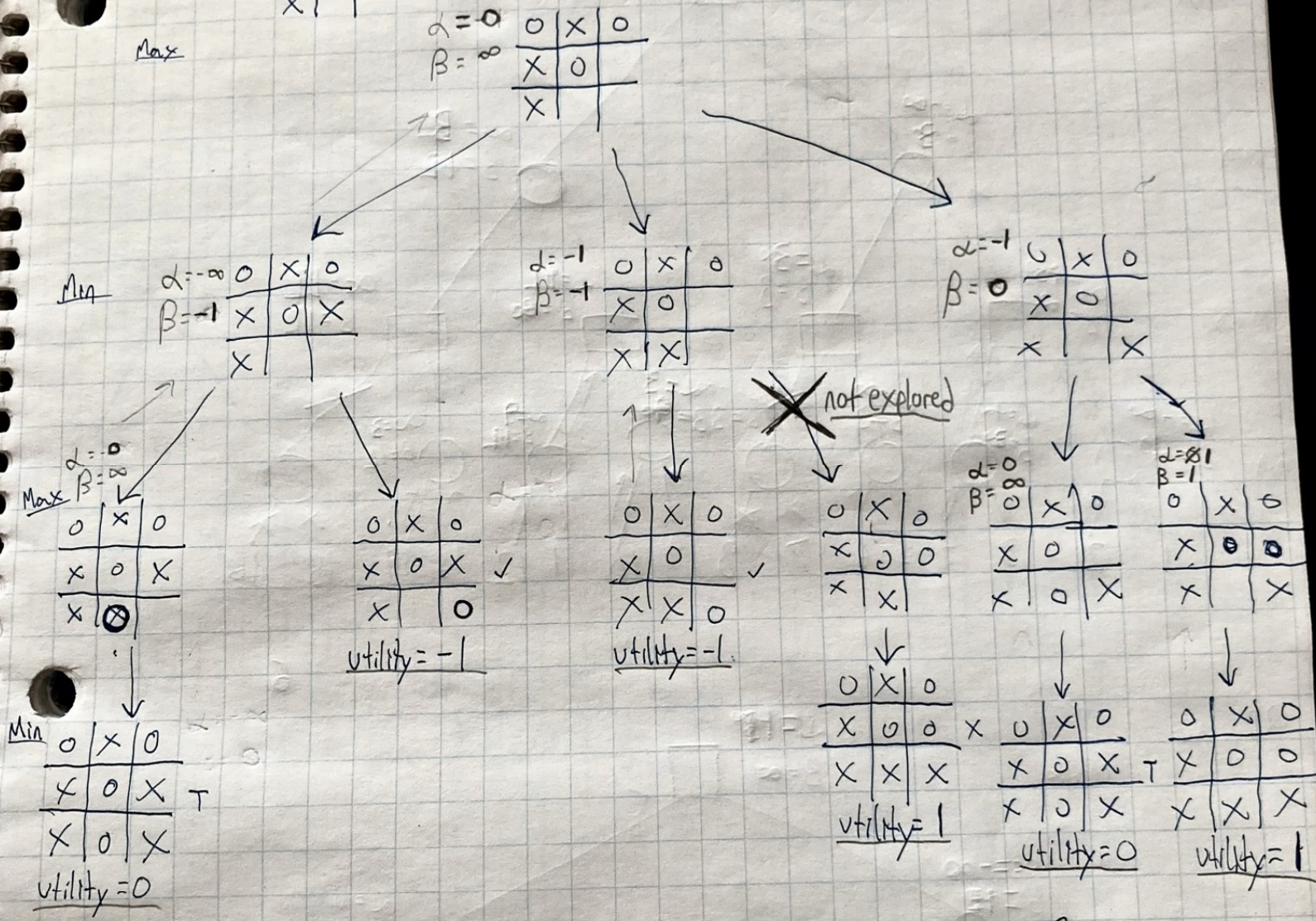
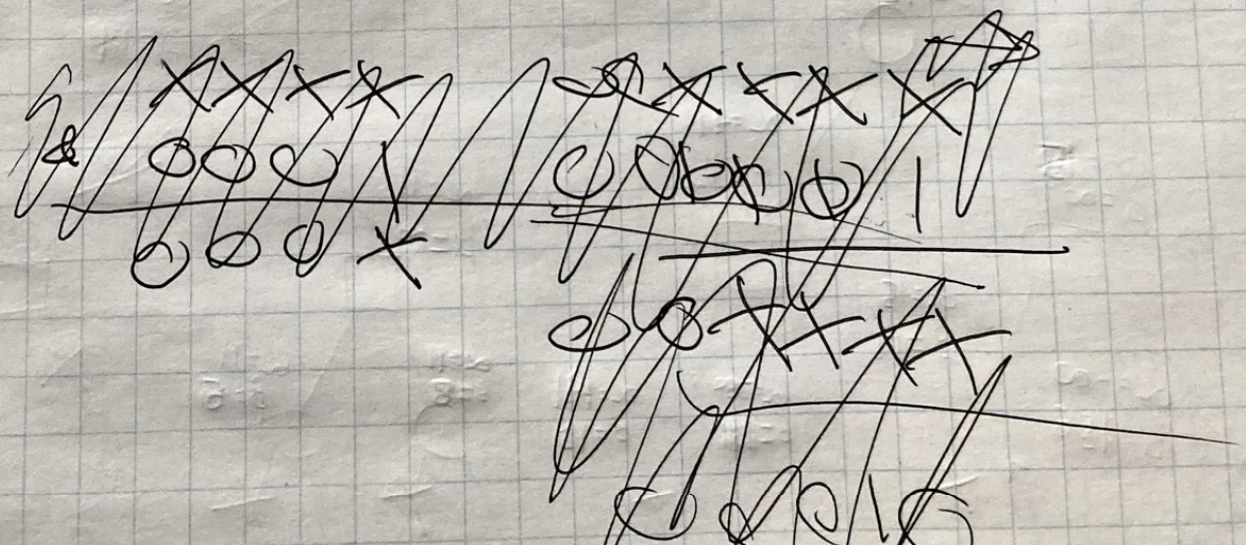
CSC 421 A2P1 - Dana Wiltsie V00867579

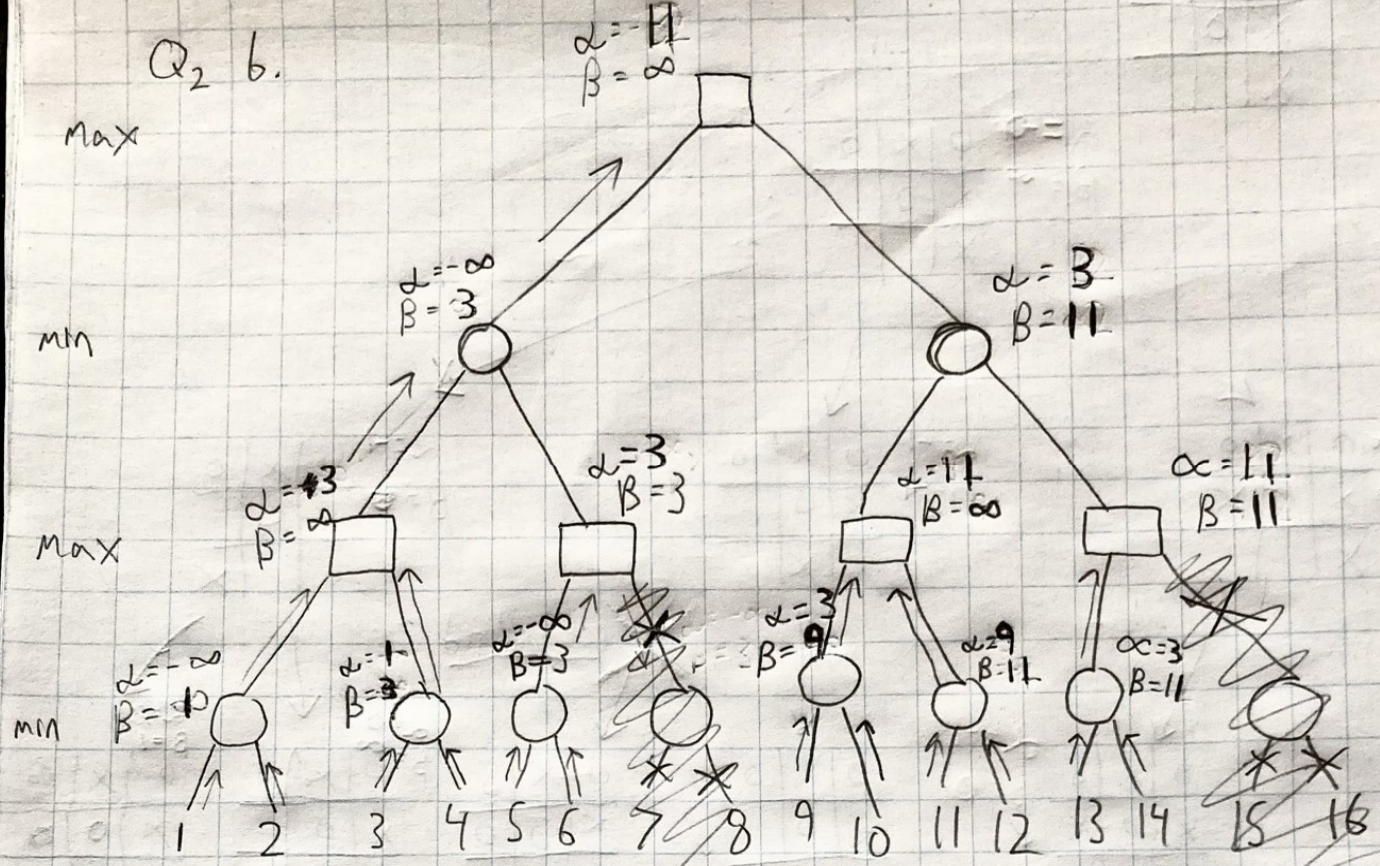
Q1.







Q_2 b.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min
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min
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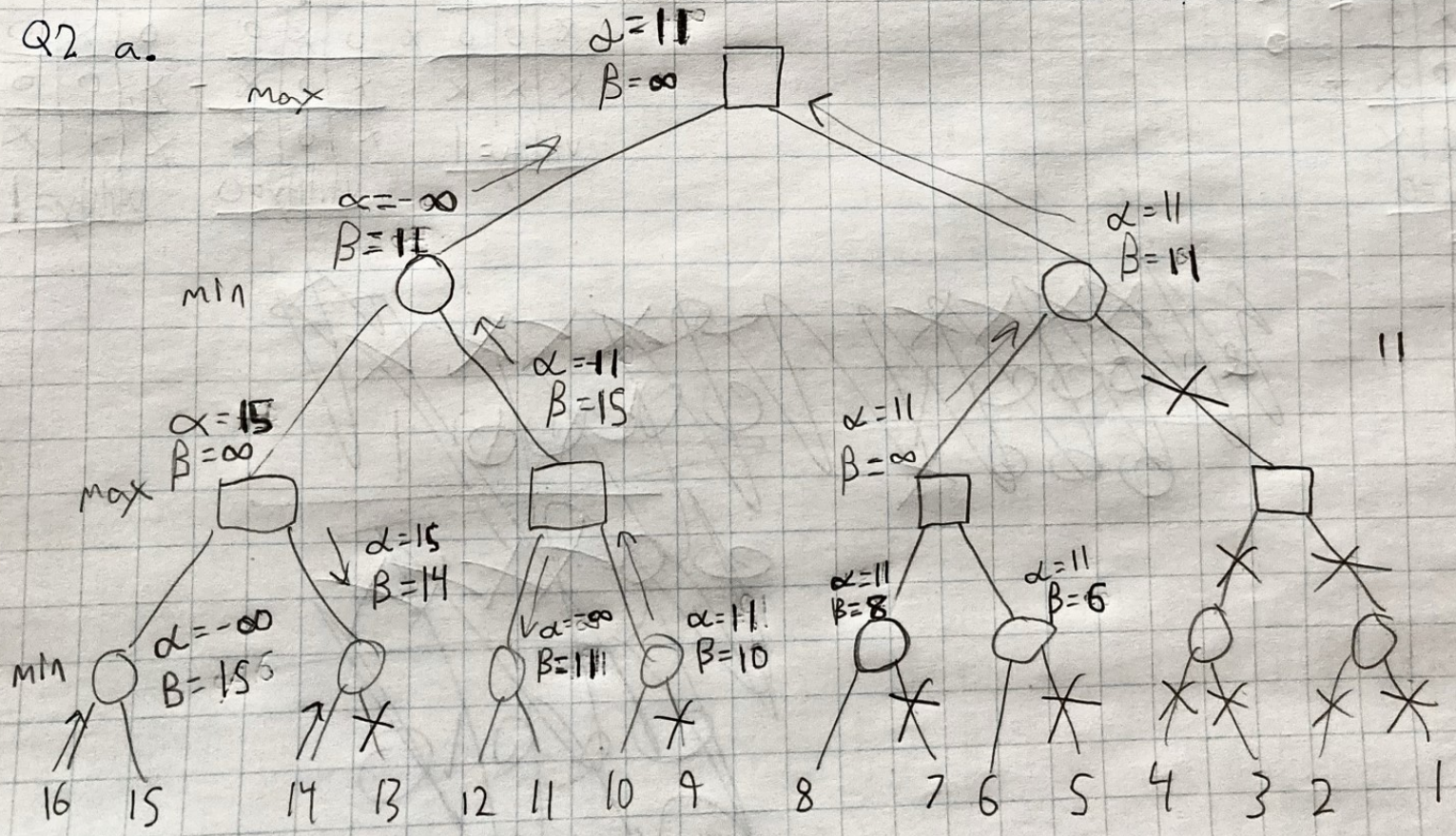
6

Q2 a.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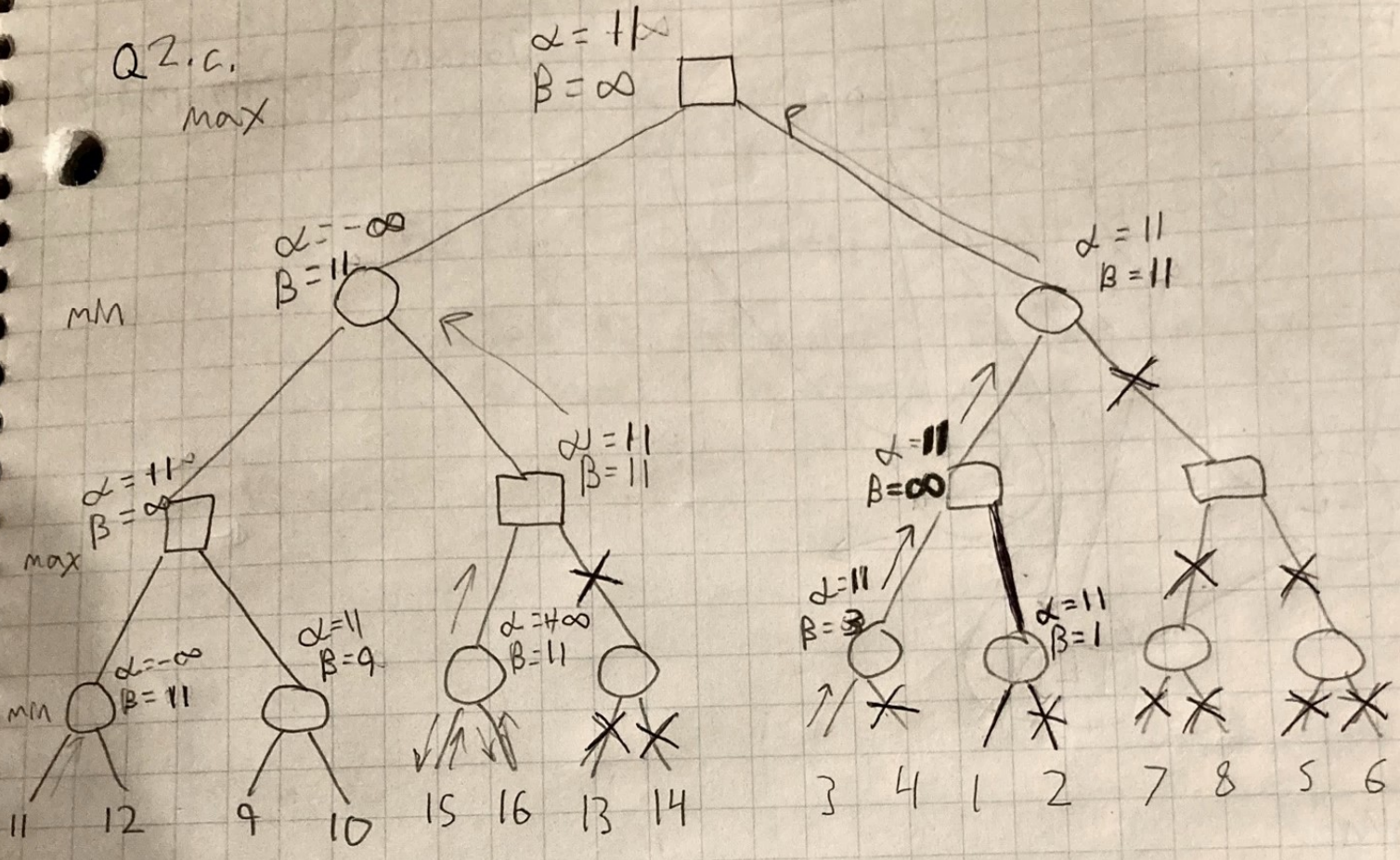
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

11

Q2.c.

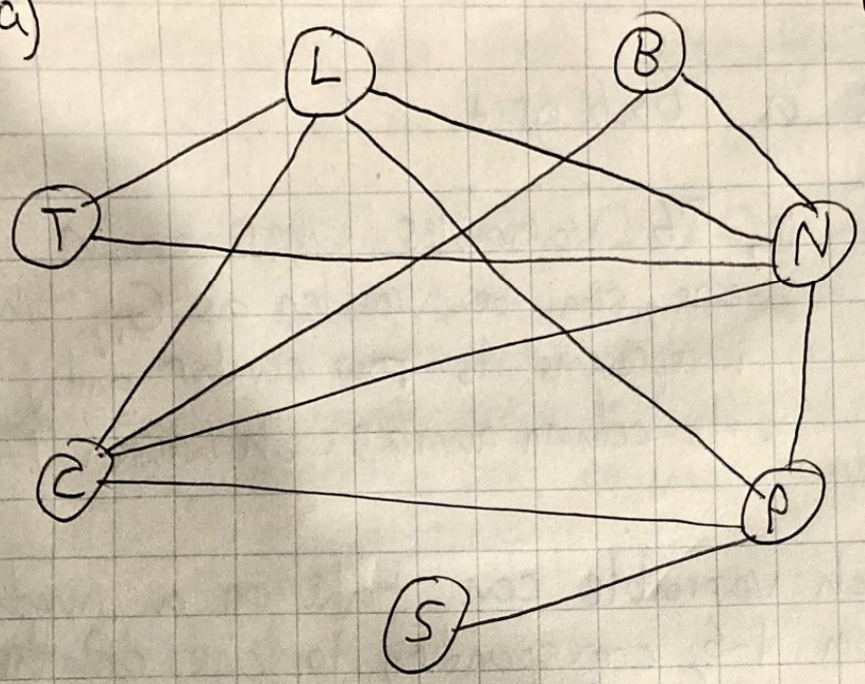


Q2d. The order of of the nodes does have a large effect on the efficacy of alphabeta pruning.

In 2a, we were able to avoid 6 nodes compared to 12 in 2c, a 50% increase in efficiency and on this small of an input.

It seems alpha-beta pruning performs poorly on inputs where the leaves are sorted in acending order.

Q3. a)



Domains:

$T = \{1\}$

$N = \{2-4\}$

$L = \{2-4\}$

$P = \{1-4\}$

$S = \{1-4\}$

$C = \{1-4\}$

$B = \{1-4\}$

b)

Depth	C	S	P	N	B	L	T	
1	1-4	1-4	1-4	2-4	1-4	2-4	1	MRV, D(N=2), FC(B,L,C,P)
2	1,3,4	1-4	1,3,4	2	1,3,4	3,4	1	MRV(L=3) FC(C,P)
3	1,4	1-4	1,4	2	1,3,4	3	1	MRV, D, C and P tie so C=1, FC(B,P)
4	1	1-4	4	2	3,4	3	1	MRV(B=4) FC(S)
5	1	1-3	4	2	3,4	3	1	MRV(B=3), FC
6	1	1-3	4	2	3	3	1	MRV(S=1)
7	1	1	4	2	3	3	1	

Q4.

Variables: a 6x6 grid.

ie, 36 variables where each one can be written as G_{ij} where i represents its row number and j represents its column number, each between 1-6.

Domain: each variable can take on a number from 1-6, corresponding to one of the six unique Greek characters.

Constraints:

- $G_{ij} \neq G_{Kj}$ for $K \neq i$, $1 \leq K \leq 6$, $1 \leq i \leq 6$ (no symbol in same column)
- $G_{ij} \neq G_{ih}$ for $h \neq j$, $1 \leq j \leq 6$, $1 \leq h \leq 6$ (no symbol in same row)
- if $i == j$ then: (no symbol in main diagonals)
  - $G_{ij} \neq G_{i \pm K, j \pm K}$ $1 \leq K \leq 5$, $1 \leq i \pm K \leq 6$, $1 \leq j \pm K \leq 6$