CS 4613

Homework #1

1. a) False
   b) False
   c) True
   d) True

2. a) $4 \cdot 2^4 = 64$
   b) $4 \cdot 2^3 = 32$
   c)
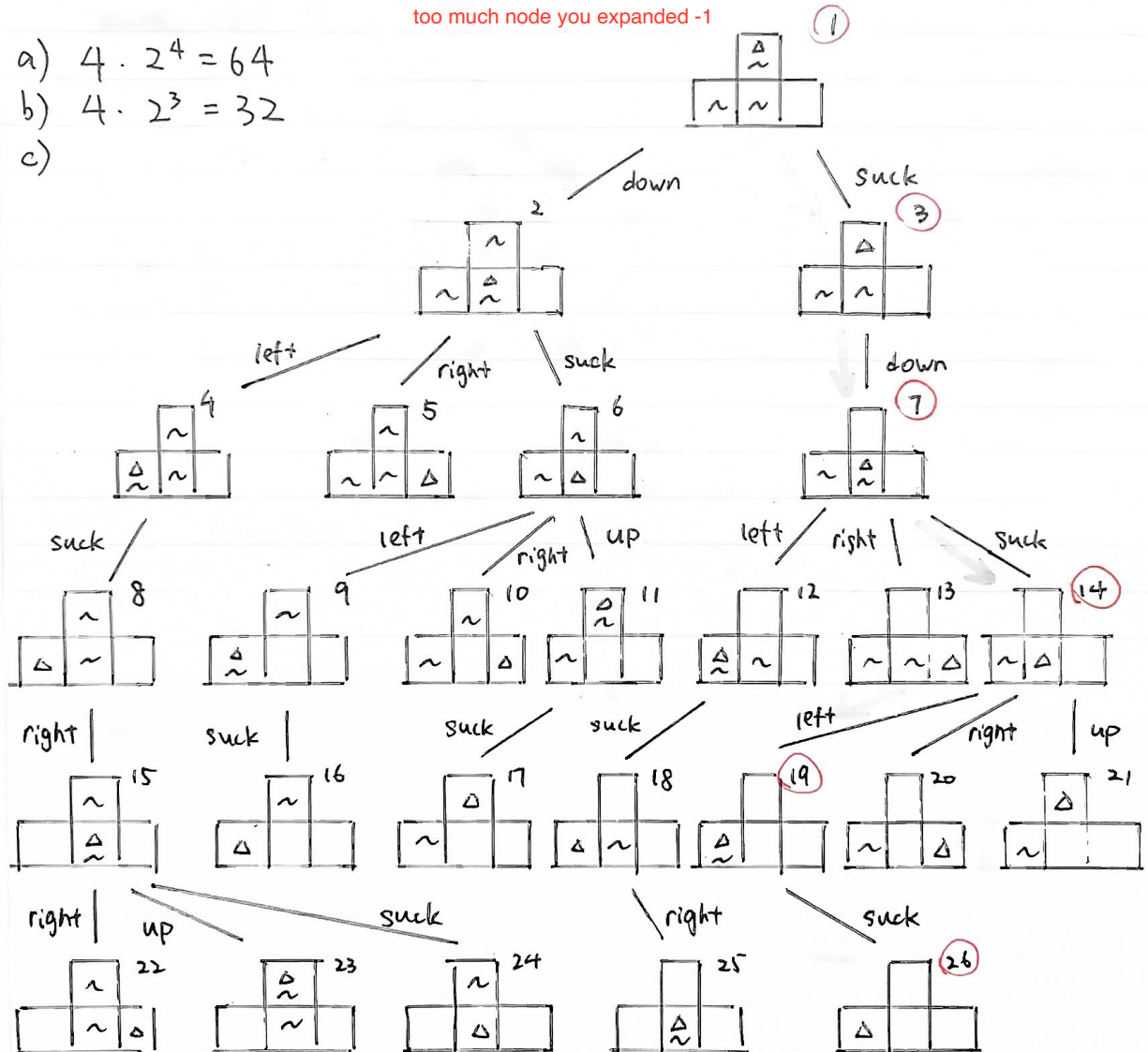
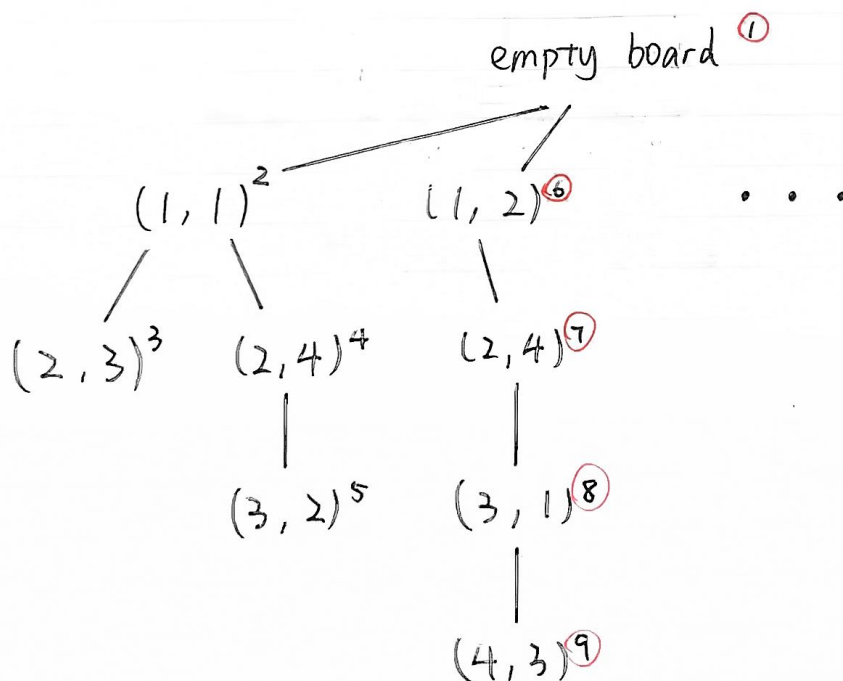d) Yes. Graph search prevents depth-first search from repeatedly reaching the same state and entering a loop. The search space of this problem is finite so depth-first search can be used.

3. a)   move blank #1 $\begin{cases} \text{left} \\ \text{right} \\ \text{up} \\ \text{down} \end{cases}$

   move blank #2 $\begin{cases} \text{left} \\ \text{right} \\ \text{up} \\ \text{down} \end{cases}$

   b) $\dfrac{16!}{2} = 10461394944000$

4. (a, b) : add queen at a^{th} row b^{th} column

empty board ①

$(1,1)^2$ $(1,2)$⑥ $\cdots$

$(2,3)^3$ $(2,4)^4$ $(2,4)$⑦

$(3,2)^5$ $(3,1)$⑧

$(4,3)$⑨

5. cost City order

0 F[1]

99 S[2]   211 B[4]

239 A[5]   250 O[6]   179 R[3]   296 U[8]   301 G[9]

314 Z[10]   357 T[12]   276 P[7]   325 C[11]   394 H[13]   438 V[14]

468 L[16]   445 D[15]   480 E[17]   530 I[19]

520 M[18]   617 N[20]