

# CSC384 A1 WrittenAnswers

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## 1

The DFS with full cycle checking causes each path will not explore the positions which have been discovered by the previous path unless the it takes less cost than the previous path to reach the positions, even though the positions could lead to the solution. But with path checking, the DFS works like brute force which simply expand all the possibilities to find the solution, this causes exponential runtime.

## 2

- (a) 4
- (b)  $N^2$
- (c)  $4^{N^2}$

## 3

$$4^{\frac{C^*}{\epsilon}}$$

In the worst case, the heuristic function is  $h(n) = 0$ , this is still admissible. And when  $h(n) = 0$ , the A\* search works exactly as uniform cost search. And the runtime for uniform cost search is  $O(b^{C^*/\epsilon})$  where  $C^*$  is the cost of the optimal solution,  $b$  is the maximum branching factor and  $\epsilon$  is the minimum cost for each action.

## 4

- (a) Yes
- (b) 3
- (c) Yes