

## Quiz 5

① Show that  $NP \subseteq EXP$ .

[5]

② Suppose  $P = NP$ . Then there is an efficient algorithm that solves

$$SAT(\varphi) = \begin{cases} 1 & \text{if } \varphi \text{ is a satisfiable} \\ & \text{boolean func.} \\ 0 & \text{o.w.} \end{cases}$$

Use this to give an efficient algorithm that solves the following problem:

$$SAT-SEARCH(\varphi) = \begin{cases} \bar{a} \in \{0,1\}^n \text{ s.t. } \varphi(\bar{a}) = 1 \\ & \text{if } \varphi \text{ is a satisfiable} \\ & \text{boolean func.} \\ 0 & \text{otherwise} \end{cases}$$

[15]

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