

Exercise sheet 9a  
COMP6741: Parameterized and Exact Computation

Serge Gaspers

19T3

**Exercise 1.** A *dominating set* of a graph  $G = (V, E)$  is a set of vertices  $S \subseteq V$  such that  $N_G[S] = V$ .

vertex-DOMINATING SET

Input: A graph  $G = (V, E)$  and an integer  $k$

Parameter:  $n = |V|$

Question: Does  $G$  have a dominating set of size at most  $k$ ?

- Prove that ETH  $\Rightarrow$  vertex-DOMINATING SET has no  $2^{o(n)}$  time algorithm.