

**RANDOM WALKS ON GROUPS, 2023 SS**  
**EXERCISES E**

- (1) Recall that for functions  $f, g: \mathbb{N} \rightarrow \mathbb{N}$  we say  $f \preceq g$  if there are  $L$  and  $A$  such that  $f(n) \leq Lg(Ln+A)+A$ , and  $f \approx g$  if  $f \preceq g$  and  $g \preceq f$ .

Show that  $n \mapsto n^d$  and  $n \mapsto n^{d'}$  are not equivalent if  $d \neq d'$ .

Conclude that being of *polynomial growth of degree  $d$*  is well defined up to  $\approx$ .