

MODERN ANALYSIS 1 - FALL 2024 - PROBLEM SET 3 - due 9/17

- 1) Show that the Heine-Borel theorem applies to  $\mathbb{R}^k$  for any  $k$ .
  
- 2) Show that in any metric space, if point  $p$  is interior to the ball  $B(\alpha, \beta)$  then it is also interior to the ball  $B(r, s)$  where  $r, s \in \mathbb{Q}$ .
  
- 3) Show that a space that is both Lindelöf and countably compact is compact.