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TMA4205 Numerical  
Linear Algebra  
Fall 2016

**Exercise set 5**

- 1 Show that both CG and GMRES are scaling independent. That is, when applied to a system  $(\lambda A)x = \lambda b$  for some  $\lambda \in \mathbb{R} \setminus \{0\}$  ( $\lambda > 0$  in the case of CG in order to preserve positive definiteness) they produce exactly the same sequence of iterates in exact arithmetics. (Of course, since the residual vectors will be scaled by  $\lambda$ , this may affect stopping criteria for the methods.)
  
- 2 Exercise 6.4, p. 212, in Saad.