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An Introduction to Computational Science by Allen Holder and Joseph Eichholz

Chapter 2 - Solving Systems of Equations

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*Problem 5.* Show that  $d_n$  from Theorem 7 is zero. Hence, if the iterative process were allowed to continue past  $n$  steps, then all iterates would be identical after step  $n$ .

*Proof.* Let the set of direction vectors  $\{d^0, d^1, \dots, d^{n-1}\}$  be linearly independent. So, this set spans  $\mathbb{R}^n$ . ■