

MCMT Homework 17

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Exercise 17.1

1. Consider v, λ so that $Pv = \lambda v$. Let v_k be the component of x with the maximum magnitude. $\lambda|v_k| = |\sum_i P_{ik}v_i| \leq \sum_i P_{ik}|v_i| \leq \sum_i P_{ik}|x_k| = |x_k|$. So $\lambda \leq 1$.
2. It is proved that the nullity of $P - I$ is 1. $(1, 1, \dots, 1)^T$ is a solution to $Pv = v$, so it is the unique solution.
- 3.