Exercises on projections onto subspaces

Problem 15.1: (4.2 #13. *Introduction to Linear Algebra:* Strang) Suppose A is the four by four identity matrix with its last column removed; A is four by three. Project $\mathbf{b} = (1, 2, 3, 4)$ onto the column space of A. What shape is the projection matrix P and what is P?

Problem 15.2: (4.2 #17.) If $P^2 = P$, show that $(I - P)^2 = I - P$. For the matrices A and P from the previous question, P projects onto the column space of A and $I - P$ projects onto the _____.

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