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Math 2250, Fall 2008, Quiz 7
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Let

$$P = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & 1 \\ 1 & 1 & 2 \end{bmatrix}$$

1. Compute the rank of P .
2. Find a basis for $\text{Im}(P)$.
3. Find a basis for $\text{Ker}(P)$.
4. (Extra credit) Show that, as a transformation from $\text{Im}(P)$ to $\text{Im}(P)$, P is invertible.
(Hint: What does it do to the basis you found for $\text{Im}(P)$?)