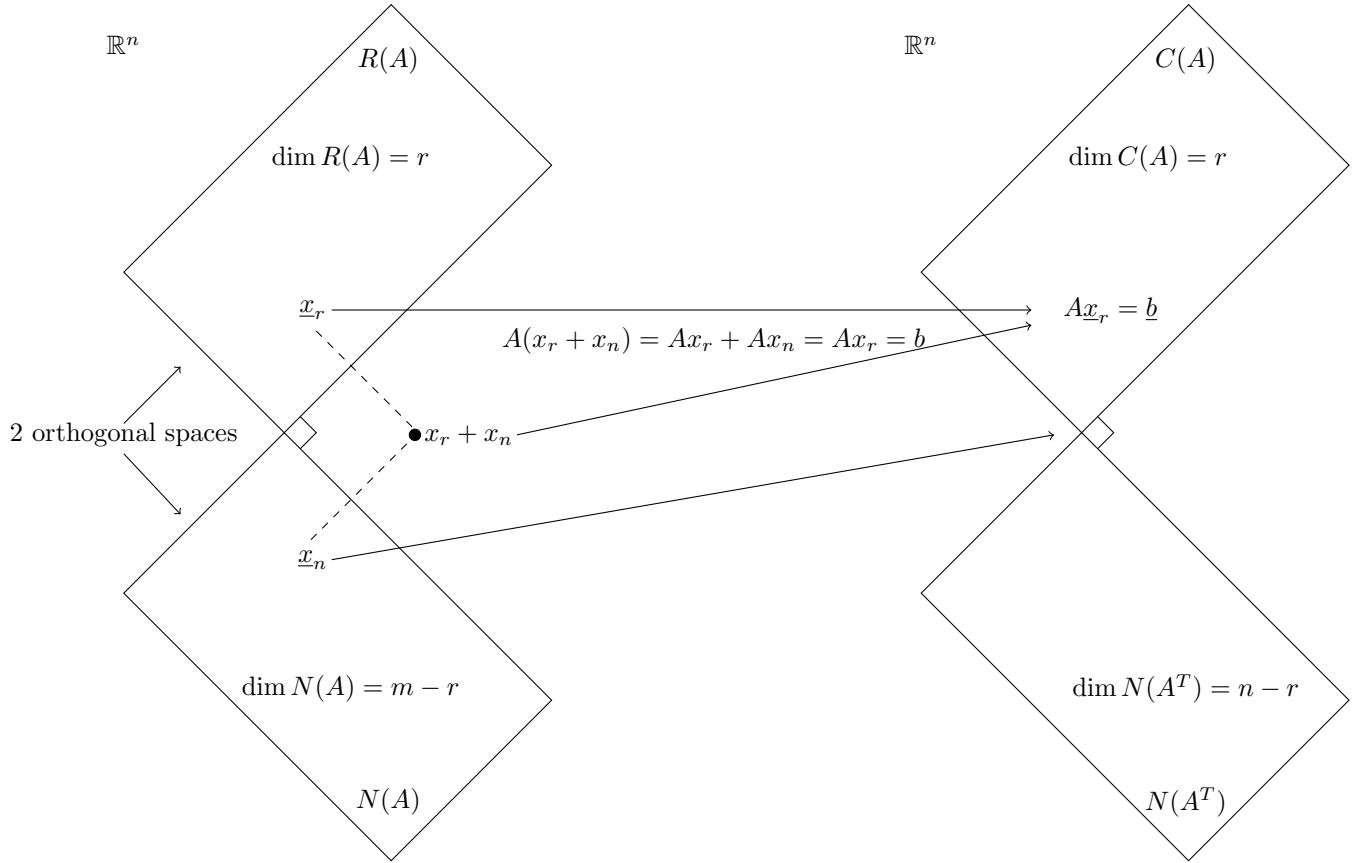
$\mathbb{R}^n$
$R(A)$
$\dim R(A) = r$
$\mathbb{R}^n$
$C(A)$
$\dim C(A) = r$
$\underline{x}_r$
$A\underline{x}_r = \underline{b}$
$A(x_r + x_n) = Ax_r + Ax_n = Ax_r = b$
2 orthogonal spaces
$x_r + x_n$
$\underline{x}_n$
$\dim N(A) = m - r$
$N(A)$
$\dim N(A^T) = n - r$
$N(A^T)$