Special Subspaces

How do we characterize subspaces, $C(A)$ and $N(A)$ in particular?

Some subspaces are easily vizualized. For example $\mathbb{R}^n$ is a subspace of itself! An we know what $\mathbb{R}^n$ looks like.

$Z = \{0\}$ is also a subspace, i.e. a general linear combo of two vectors in Z is

$$c_1 0 + c_2 0 = 0 + 0 = 0$$

which is back in Z. And Z is easily visualized: it is just the origin in $\mathbb{R}^n$.

$\mathbb{R}^n$ and Z are called the **trivial subspaces** of $\mathbb{R}^n$

Note: Every subset S of $\mathbb{R}^n$ that is also a subspace **must contain the zero vector** (by closure under scalar multiplication):

$$\underbrace{0}_{\text{real }\#} \times \underbrace{v}_{\text{any vector in } S} = \underbrace{0}_{\text{zero vector}}$$