

Reddit LADR Study Group

Chapter 1

1.A

Problem 1.

$$\frac{1}{a+bi} \cdot \frac{a-bi}{a-bi} = \frac{a-bi}{a^2+b^2} = \frac{a}{a^2+b^2} - \frac{b}{a^2+b^2}i$$

so we take $c = \frac{a}{a^2+b^2}$ and similar for d . Note that $a^2+b^2 = |a+bi|^2$ and it is often helpful to think of complex operations in terms of the modulus. In effect what we've seen is $1/z = \frac{\bar{z}}{z\bar{z}} = \frac{\bar{z}}{|z|^2}$.

1.B

Problem 1.

From the definitions this requires showing that \vec{v} is the element such that if added to $-\vec{v}$ the result is $\vec{0}$. But this just follows again from the definition.

1.C

Problem 1.

(a) and (d) are subspaces, the others are not. You can rule out (b) because it does not contain $\vec{0}$. You can rule out (c) by additivity: $\begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ are each in the set but their sum is not.