

HOMEWORK 2.

Due Monday, September 19, in class.

1. Do Problem 12 in Section 1.4.
2. Do Problem 15 in Section 1.4.
3. Under what conditions is the union of two subspaces a subspace? What about the union of more than two subspaces?
4. Prove or disprove: If \mathcal{L} , \mathcal{M} , and \mathcal{N} are subspaces of a vector space then $\mathcal{L} \cap (\mathcal{M} + (\mathcal{L} \cap \mathcal{N})) = (\mathcal{L} \cap \mathcal{M}) + (\mathcal{L} \cap \mathcal{N})$. [The sum of subsets is defined on page 22.]
5. Prove or disprove: Three vectors with rational coordinates are linearly independent in \mathbb{R}^3 if and only if they are linearly independent in \mathbb{Q}^3 .