**Reading.** §§3.5–3.7.

**Problems from the book:** the starred problems may be carefully graded. You will be given a "completeness" score, depending on how carefully you complete these problems.

- §3.3: 5, 6*, 9, 13
- §3.4: 8, 11
- §3.5: 15, 17, 14*
- §3.6: 6*

**Additional problems:** These will be carefully graded!

1. Suppose $V$ and $W$ are vector spaces over $\mathbb{R}$. Show that the set of linear transformations
$$\mathcal{L}(V, W) = \{T : V \to W \mid T \text{ is linear}\},$$
is itself a vector space over $\mathbb{R}$.
2. Suppose that $f : \mathbb{R}^2 \to \mathbb{R}$ satisfies Laplace's equation $D_1^2 f + D_2^2 f = 0$. True or false: the function
$$g\begin{pmatrix} x \\ y \end{pmatrix} = f\begin{pmatrix} \frac{x}{x^2+y^2} \\ \frac{y}{x^2+y^2} \end{pmatrix}$$
also satisfies Laplace's equation. Prove this, or give a counterexample.