MATH 231: Differential Equations with Linear Algebra

Hand-Checked Assignment #2, due date: Thurs., Mar. 19, 2020

★11 From Section 1.6 (ODELA), pp. 37–40, do Exercise 1.6.8 parts (a) and (b).

★12 **True or False** (with justification). Suppose the vectors $(\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3)$ form a basis for a space $\mathcal{V}$. From them, we generate three new vectors $\mathbf{w}_1 = \mathbf{v}_1 + \mathbf{v}_2$, $\mathbf{w}_2 = \mathbf{v}_1 + \mathbf{v}_3$, and $\mathbf{w}_3 = \mathbf{v}_2 + \mathbf{v}_3$. Then these new vectors $(\mathbf{w}_1, \mathbf{w}_2, \mathbf{w}_3)$ also are a basis for $\mathcal{V}$.

★13 From Section 1.7, pp. 44–46, do Exercise 1.7.9.

★14 From Section 1.12, pp. 82–84, do Exercise 1.12.3, parts (b) and (c). [Here, $p_{\mathbf{A}}(\lambda)$ is Kapitula's notation for the characteristic polynomial, so we must be assuming $\mathbf{A}$ is square, $p_{\mathbf{A}}(\lambda) = \det(\mathbf{A} - \lambda\mathbf{I})$, and you can discern the number of rows/columns of $\mathbf{A}$ from the degree of $p_{\mathbf{A}}(\lambda)$.]

★15 From Section 1.12, pp. 82–84, do Exercise 1.12.8.