

Math 52 Homework 13 Answers

David Dumas

The answers for problems 7.1.12, 7.2.6, and 7.2.21 appear in the back of the textbook.

- **Problem 7.1.3**

- (a) Linear
- (b) Linear
- (c) Linear
- (d) Not linear (because $T(\mathbf{0}) \neq \mathbf{0}$).

- **Problem 7.1.6**

- (a) Satisfies neither.
- (b) Satisfies both (linear).
- (c) Satisfies both (linear).
- (d) Satisfies neither.

- **Problem 7.2.5**

$$A = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 1 \end{pmatrix}$$

- **Problem 7.2.22**

- (a) Change of basis from \mathbf{v} 's to \mathbf{w} 's:

$$\begin{pmatrix} 1 & 1 & 1 \\ 1 & 0 & 0 \\ 1 & -1 & 1 \end{pmatrix}$$

- (b) Change of basis from \mathbf{w} 's to \mathbf{v} 's:

$$\begin{pmatrix} 0 & 1 & 0 \\ \frac{1}{2} & 0 & -\frac{1}{2} \\ \frac{1}{2} & -1 & \frac{1}{2} \end{pmatrix}$$

- **Problem 7.2.29**

- (a) $\begin{pmatrix} 0 & 3 \\ 0 & 0 \end{pmatrix}$
- (b) $\begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$

- **Problem 7.2.33**

False. A similar true statement would read, "If we know $T(\mathbf{v})$ for n linearly independent vectors in \mathbb{R}^n , then we know $T(\mathbf{v})$ for every vector in \mathbb{R}^n ."