Math 320 – Linear Algebra – David Dumas – Fall 2018

Homework 9

Due Monday October 29

From the textbook:

- Section 3.2 (problem begin on p165): 2bef, 5cd, 6ab, 7, 14, 17

Note: Label every row or column operation you perform, like this:

$$\begin{pmatrix} 1 & 2 & 1 \\ 0 & 2 & 3 \\ 1 & 0 & 0 \end{pmatrix} \xrightarrow{\text{Exchange rows 2,3}} \begin{pmatrix} 1 & 2 & 1 \\ 1 & 0 & 0 \\ 0 & 2 & 3 \end{pmatrix}$$

Additional problem:

For the next problem, recall that:

- If W is a subspace of V, then the *quotient map* is the linear transformation $\pi : V \to V/W$ given by $\pi(x) = x + W$.
- If $T : V \to W$ is a linear transformation, and if V' is a subspace of V, then we can define a linear transformation $T|_{V'} : V' \to W$ by restricting T to V'.

(P1) Let V be a vector space and let W and Z be subspaces of V. Let $\pi : V \to V/W$ be the quotient map. Show that $\pi|_Z$ is an isomorphism if and only if $V = W \oplus Z$.