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LARSON—MATH 310—CLASSROOM WORKSHEET 05 Elimination and Backsolving

Review

- What is the "linear combination of columns" definition of a $m \times n$ matrix A times a vector x in \mathbb{R}^n ?
- What is the "dot product with rows" definition of a $m \times n$ matrix A times a vector x in \mathbb{R}^n ?
- How can we check if 3 vectors in \mathbb{R}^3 are co-planar?
- 1. What does it mean for vectors to be *linearly independent*?

Let
$$\vec{u} = \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}$$
, $\vec{v} = \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}$ and $\vec{w} = \begin{bmatrix} 0 \\ 0 \\ -1 \end{bmatrix}$.

2. Are \vec{u}, \vec{v} , and \vec{w} linearly independent or linearly dependent?

3. Write the augmented matrix corresponding to this system of linear equations.

4. Use row operations to get this matrix into upper triangular form.

5. Write the corresponding system of equations.

6. Back-solve. (Check your solution in the original system).

7. Write the augmented matrix corresponding to this system of linear equations.

8. Use row operations to get this matrix into upper triangular form.

9. Write the corresponding system of equations.

10. Back-solve. (Check your solution in the original system).