

Due February 10

Name

Be sure to re-read the **WRITING GUIDELINES rubric**, since it defines how your project will be graded. In particular, you may discuss this project with others but **you may not collaborate on the written exposition of the solution**.

“Whoever despises the high wisdom of mathematics nourishes himself on delusion and will never still the sophistic sciences whose only product is an eternal uproar.” – Leonardo Da Vinci

Advanced Reading Exercise

Reading mathematics well involves skills that are not typically stressed in other courses. In particular, it is a good idea to use paper and pencil while reading. This is especially necessary when reading a proof that is as dense with notation as is Theorem VFSL (Vector Form of Solutions to Linear Systems) on pages 109-112. The **use** of this theorem is actually quite easy as is illustrated by the three step process described in the textbook. The value of the proof is that it **verifies** that the process will always produce the solution set of the linear system.

The following matrix B is the row-equivalent matrix in reduced row-echelon form for the augmented matrix $[A|\mathbf{b}]$ of the linear system of equations $LS(A, \mathbf{b})$. Write a paper that uses B as a guide to follow the proof of Theorem VFSL. Specifically, **using the notation of the proof of the theorem**, find the solution set of $LS(A, \mathbf{b})$ by following – and explaining – the steps of the proof.

$$[A|\mathbf{b}] = \begin{bmatrix} 1 & -3 & -2 & 0 & 2 & 7 & 11 \\ 2 & 2 & 4 & -1 & 5 & -5 & -3 \\ 3 & 0 & 3 & 1 & 5 & 6 & 7 \\ 4 & -4 & 0 & 0 & 8 & 12 & 20 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 0 & 1 & 0 & 2 & 1 & 2 \\ 0 & 1 & 1 & 0 & 0 & -2 & -3 \\ 0 & 0 & 0 & 1 & -1 & 3 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$