

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Let A and B be two $n \times n$ matrices. Show that, if AB is invertible, then B is also invertible.

- (b) Show that if A is an invertible $n \times n$ matrix, then the cancelation law $AB = AC \Rightarrow B = C$ holds, for all matrices B and C (for which the products make sense).

2. Decide whether the transformation $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$, defined by

$$T(x_1, x_2) = (-5x_1 + 9x_2, 4x_1 - 7x_2)$$

is invertible. If so, find a similar expression for its inverse T^{-1} .

3. Calculate the following number.

$$\begin{vmatrix} 1 & -2 & 5 & 2 \\ 0 & 0 & 3 & 1 \\ 2 & -6 & -7 & 5 \\ 5 & 0 & 4 & 0 \end{vmatrix} =$$