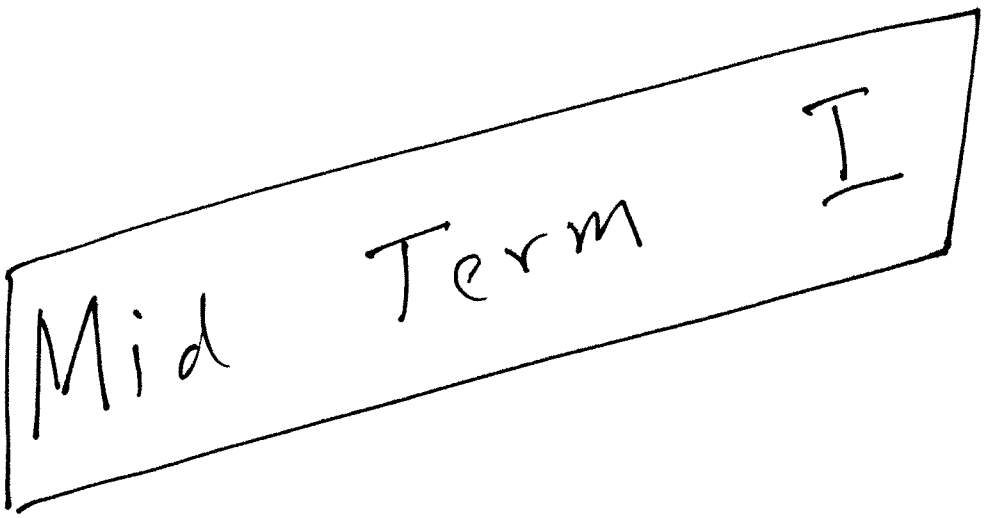
Mid Term I

① Consider the following pair of equations.

$$2x_1 - 6x_2 = 18$$
$$-4x_1 + 10x_2 = -38$$

ⓐ Write down the associated augmented matrix.

ⓑ Using elementary row operations convert the augmented matrix to a row echelon form.

ⓒ Convert the row echelon form to a "reduced row echelon form" using elementary row operations.

ⓓ Using either ⓑ or ⓒ write down a solution to the pair of equations.

(2) Let

$$A = \begin{pmatrix} 3 & 2 & 0 \\ 1 & 0 & -1 \\ 5 & 4 & 0 \end{pmatrix}, \quad B = \begin{pmatrix} -1 & 0 & 3 \\ 0 & 3 & 0 \\ 1 & -1 & 2 \end{pmatrix}$$

compute

(a) $A + B$

(b) BA

(c) $B^T A^T$

(3) For the matrix A in (2) calculate the inverse A^{-1}.

(4) (a) for the matrix B in (2) calculate $\det B$.

(b) using Cramer's rule solve the equation

$$B\,\mathbf{x} = \mathbf{b}$$

where $\mathbf{x} = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$