PAST QUIZ QUESTIONS

You have to show all calculation steps to obtain mark

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1 . Find A if $\left(2A^T - 5\begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}\right)^T = 4A - 9\begin{bmatrix} 1 & 1 \\ -1 & 0 \end{bmatrix}$.

2. Mark each statement **True or False**.

_____2.1 If A is an *mxn* matrix and the equation $\underline{\mathbf{A}}\underline{\mathbf{x}} = \underline{\mathbf{b}}$ is consistent for every $\underline{\mathbf{b}}$, then A has m pivot columns.

_____2.2 If *mxn* matrix A has a pivot position in every row, then the equation Ax has a unique solution for each $\underline{\mathbf{b}}$

3. For a system of linear equation below where *C* and *D* are real constants

$$\begin{aligned} x_1 + 2x_2 + x_3 + 5x_5 + 2x_6 &= 1 \\ 2x_1 + 5x_2 + 2x_3 &= 2 - 3x_4 - 6x_5 - x_6 \\ x_1 + 3x_2 + Cx_3 + 3x_4 + x_5 &= 5 - Dx_6 \end{aligned}$$

Write down the matrix equation ($\underline{\mathbf{A}}\underline{\mathbf{x}} = \underline{\mathbf{b}}$) and the augmented matrix that represents the above system of linear equations.

a) What are values of *C* and *D* that make this system inconsistent?

b) If *C*=1, what are all possible values of *D* that make this system consistent?

c) If *D* = 0, choose a value of *C* that make this system consistent. Also solve the given linear system with your specified value of *C*. **Write down the solution in vector form.**

4. Suppose A is a 4 by 3 matrix, and the complete solution to

$$\underline{Ax} = \begin{bmatrix} 3 \\ 18 \\ 15 \\ 27 \end{bmatrix} \quad \text{is} \quad \underline{x} = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} + c \begin{bmatrix} 0 \\ 2 \\ -1 \end{bmatrix}$$

(a) What is the third column of *A*?

(b) What is the second column of *A*?

(c) Give all unknown information about the first column of *A*.