CONCORDIA UNIVERSITY
Department of Mathematics & Statistics

MATH 204/4 all sections except EC: - Vectors and Matrices
Midterm - Winter 2019 (1h30min)

Only approved calculators are permitted.
Justify all your answers.
All questions have equal value.

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1. Find the inverse of the matrix $A = \begin{pmatrix} 1 & 3 & -4 \\ 1 & 5 & -1 \\ 3 & 13 & -6 \end{pmatrix}$.

2. If $(3A - 2I)^{-1} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$, find A.

4 3
2 1

3. Find determinant A where $A = \begin{pmatrix} 1 & 2 & 2 & 3 \\ 1 & 0 & -2 & 0 \\ 3 & -1 & 1 & -2 \\ 4 & -3 & 0 & 2 \end{pmatrix}$

4. Solve by Cramer's rule only

$$\begin{aligned} 3x - 2y + z &= 1 \\ x - 7y + 2z &= 2 \\ 2x + 4y + 4z &= 3 \end{aligned}$$

5. If $AX = B$ where $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \\ 6 & 7 & 8 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 1 & 1 \\ 1 & 4 \end{pmatrix}$, find X.

$AX = B$
$A^{-1}AX =$

6. Find the determinant of $A = \begin{pmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{pmatrix}$.