Practice for Geometry, Proof and Systems of Equations

Geometry, Proof and Systems of Equations Assessment Standard 1.1

1. Use Gaussian elimination to solve the following system of equations

$$\begin{aligned} x - y &= 5 \\ 3y + z &= -7 \\ x - 2y - z &= 8 \end{aligned}$$

(4)

2. Given the matrices $A = \begin{pmatrix} -4 & 1 \\ 2 & 5 \end{pmatrix}$, $B = \begin{pmatrix} b & -2 \\ -1 & 4 \end{pmatrix}$ and $C = \begin{pmatrix} -2 & 4 \\ 1 & c \end{pmatrix}$ where b and c are constants. Find

   (a) $3A - B + 2C$ (2)

   (b) BC (2)

3. For the matrix $D = \begin{pmatrix} 1 & -1 & 0 \\ 0 & 3 & 1 \\ 1 & -2 & -1 \end{pmatrix}$ find det$D$. (3)

4. Given the matrices $E = \begin{pmatrix} -2 & 4 \\ 1 & e \end{pmatrix}$ and $F = \begin{pmatrix} f & 4 & 5 \\ 1 & 0 & 3 \\ 6 & 2 & -1 \end{pmatrix}$

   (a) Find E^{-1} (2)

   (b) Determine the value(s) of f for which F is singular (3)

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