

OPMT 5701

Homework 2

Problem 1 Given that

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} = \begin{bmatrix} 1 & 4 & 7 \\ 3 & 9 & 1 \\ 2 & -5 & 3 \end{bmatrix}$$

Find the cofactors $|C_{11}|$ $|C_{32}|$ $|C_{21}|$

Problem 2 Find the determinant of

$$\begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$$

Problem 3 Find the determinant of

$$A = \begin{bmatrix} 1 & -4 & 3 \\ 0 & 1 & -1 \\ 1 & 2 & 0 \end{bmatrix}$$

Problem 4 Find the inverse of A using the formula $A^{-1} = \frac{1}{|A|} \text{Adj } A$ if

$$A = \begin{bmatrix} 1 & 1 \\ 2 & 3 \end{bmatrix}$$

Problem 5 Find the inverse for

$$A = \begin{bmatrix} 4 & 1 & -5 \\ -2 & 3 & 1 \\ 3 & -1 & 4 \end{bmatrix}$$

Problem 6 Use matrix inversion to solve the following systems for x and y

$$\begin{array}{ll} 4x + 3y = 28 & -4x + y = 2 \\ 2x + 5y = 42 & 2x + 2y = 20 \end{array}$$

Problem 7 Solve the system $Ax = d$ by using Cramer's Rule:

$$\begin{array}{ll} (a) & \begin{array}{l} 4x + 3y = 28 \\ 2x + 5y = 42 \end{array} \\ (b) & \begin{array}{l} 4x_1 + x_2 - 5x_3 = 8 \\ -2x_1 + 3x_2 + x_3 = 12 \\ 3x_1 - x_2 + 4x_3 = 5 \end{array} \end{array}$$