SUMMARY OF SECTION 2.4

IF A IS A SQUARE MATRIX, THEN THE <u>MINOR OF a_{ij}</u> IS DENOTED M_{ij} AND IS DEFINED TO BE THE DETERMINANT OF THE SUBMATRIX THAT REMAINS AFTER THE i^{TH} ROW AND j^{TH} COLUMN ARE DELETED FROM A. THE NUMBER $(-1)^{i+j} M_{ij}$ IS DENOTED BY C_{ij} AND IS CALLED THE <u>COFACTOR OF a_{ij}</u>.

CALCULATING DET(A) BY COFACTOR EXPANSION:

$$\det(A) = a_{1j} C_{1j} + a_{2j} C_{2j} + \cdots + a_{nj} C_{nj}$$

(EXPANSION ALONG THE j^{TH} COLUMN)

$$\det(A) = a_{i1} C_{i1} + a_{i2} C_{i2} + \cdots + a_{in} C_{in}$$

(EXPANSION ALONG THE i^{TH} ROW)

IF A IS AN $n \times n$ MATRIX, THEN
$$\begin{bmatrix} C_{11} & C_{12} & \cdots & C_{1n} \\ C_{21} & C_{22} & \cdots & C_{2n} \\ \vdots & \vdots & & \vdots \\ C_{n1} & C_{n2} & \cdots & C_{nn} \end{bmatrix}$$
IS CALLED THE <u>MATRIX OF COFACTORS FROM A</u>.

THE TRANSPOSE OF THIS MATRIX IS CALLED THE <u>ADJOINT OF A</u> AND IS DENOTED $\operatorname{adj}(A)$.

<u>THEOREM</u> – IF A IS INVERTIBLE, THEN

$$A^{-1} = \frac{1}{\det(A)} \operatorname{adj}(A).$$