

Honors Algebra 2 Notes

3.7 Evaluate Determinants

Name _____

Determinant: a real number associated with any square matrix

Notation: determinant of matrix A is denoted by _____ or by _____

Every _____ matrix ($n \times n$) has a determinant.

KEY CONCEPT

For Your Notebook

The Determinant of a Matrix

Determinant of a 2×2 Matrix

$$\det \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - cb$$

The determinant of a 2×2 matrix is the difference of the products of the elements on the diagonals.

Determinant of a 3×3 Matrix

STEP 1 Repeat the first two columns to the right of the determinant.

STEP 2 Subtract the sum of the red products from the sum of the blue products.

$$\det \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix} = \begin{vmatrix} a & b & c & a & b \\ d & e & f & d & e \\ g & h & i & g & h \end{vmatrix} = (aei + bfg + cdh) - (gec + hfa + idb)$$

Evaluate the determinant of each matrix:

***Always subtract the products *WATCH YOUR SIGNS!!!**

<p>1. $\begin{bmatrix} 9 & 4 \\ 3 & 5 \end{bmatrix}$</p>	<p>2. $\begin{bmatrix} -2 & 7 \\ -5 & 8 \end{bmatrix}$</p>
<p>3. $\begin{bmatrix} 2 & -1 & -3 \\ 4 & 1 & 0 \\ 3 & -4 & -2 \end{bmatrix}$</p>	<p>4. $\begin{bmatrix} 4 & -1 & 2 \\ -3 & -2 & -1 \\ 0 & 5 & 1 \end{bmatrix}$</p>