

4.3 (Part 1)

2x2 Determinants

A determinant is a square array of number or variables. Vertical bars are used to enclose the array and to signify a determinant.

The determinant below has two rows and two columns and is called a second order determinant:

$$\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$$

We find the value of a second order determinant as follows:



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

Example: Find the value of each determinant.

$$\begin{vmatrix} -5 & 3 \\ 4 & 2 \end{vmatrix}$$

$$-10 - 12$$

$$\textcircled{-22}$$



Example: Find the value of each determinant.

$$\begin{vmatrix} -1 & 8 \\ 5 & 0 \end{vmatrix}$$

$$0 - 40$$

$$-40$$



Example: Find the value of each determinant.

$$\begin{vmatrix} 2 & -2 \\ 7 & -7 \end{vmatrix}$$

$$-14 + 14$$

$$0$$



Example: Evaluate using determinants.

$$\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} + \begin{vmatrix} 5 & 2 \\ -2 & 6 \end{vmatrix}$$

$$4 - 6 \quad 30 + 4$$

$$-2 + 34$$



$$\begin{array}{c} \diagup \quad \diagdown \\ \textcircled{32} \end{array}$$