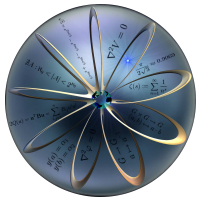

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anti-diagonal matrix

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Let A be a square matrix (over any field $\mathbb{F}$). An entry in A is an *anti-diagonal entry* if it is on the line going from the lower left corner of A to the upper right corner. If all entries in A are zero except on the anti-diagonal, then A is an *anti-diagonal matrix*.

If $a_1, \ldots, a_n \in \mathbb{F}$, let

$$\operatorname{adiag}(a_1, \ldots, a_n) = \begin{pmatrix} 0 & 0 & 0 & 0 & a_1 \\ 0 & 0 & 0 & a_2 & 0 \\ 0 & 0 & a_3 & & 0 \\ 0 & \cdot & 0 & & 0 \\ a_n & 0 & 0 & & 0 \end{pmatrix}.$$

Properties of anti-diagonal matrices

1. If A and D are $n \times n$ anti-diagonal and diagonal matrices, respectively, then AD, DA are anti-diagonal.

2. The product of two anti-diagonal matrices is an diagonal matrix.