



**Definition**

The *matrix exponential* of a real matrix  $M \in \mathbf{R}^{n \times n}$  is the matrix

$$I + M + \frac{M^2}{2!} + \frac{M^3}{3!} + \cdots .$$

It is a (nontrivial) fact that this (matrix) power series converges for all  $M \in \mathbf{R}^{n \times n}$ .



