

Properties of product

Defn: $\prod_{i=1}^n x_i = x_1 \cdot x_2 \cdot \dots \cdot x_n$

Properties

$$1) \prod_{i=1}^n c = c^n$$

$$2) \prod_{i=1}^n (c \cdot x_i) = c^n \cdot \left(\prod_{i=1}^n x_i \right)$$

$$3) \prod_{i=1}^n \exp(c \cdot x_i) = \exp\left(c \cdot \sum_{i=1}^n x_i\right)$$

$$4) \prod_{i=1}^n \exp(c \cdot x_i^d) = \exp\left(c \cdot \sum_{i=1}^n x_i^d\right)$$

$$5) \log\left(\prod_{i=1}^n x_i\right) = \sum_{i=1}^n \log x_i$$