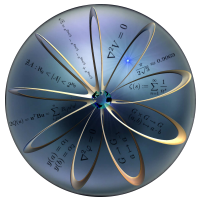

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termwise differentiation

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Theorem. If in the open interval I, all the of the series

$$f_1(x)+f_2(x)+\cdots \tag{1}$$

have continuous derivatives, the series converges having sum $S(x)$ and the differentiated series $f_1'(x)+f_2'(x)+\cdots$ `http://planetmath.org/SumFunctionOfSeries`converges uniformly on the interval I, then the series (1) can be differentiated termwise, i.e. in every point of I the sum function $S(x)$ is differentiable and

$$\frac{d\,S(x)}{dx} = f_1'(x)+f_2'(x)+\cdots$$

The situation implies also that the series (1) converges uniformly on I.