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GEOMETRIC CONSEQUENCES OF A MEAN VALUE THEOREM

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Abstract.Let $F:D\subset\mathbb{R}^n\to\mathbb{R}^m$, $F=(F_1,\ldots,F_m)$; $x^*\in\mathbb{R}^n; y^*\in\mathbb{R}^m$. In this note we apply Lagrange's mean value theorem to the real function

$$f:D\to\mathbb{R},\ f(x)=\langle x-x^*,x-x^*\rangle+\langle F(x)-y^*,F(x)-y^*\rangle$$

and present a geometric interpretation in case of m=1 or n=1.

($\langle\cdot,\cdot\rangle$ denotes the canonical scalar product in $\mathbb{R}^p, p\in\mathbb{N}^*$)