<http://ramanujan.math.trinity.edu/wtrench/texts/TRENCH_REAL_ANALYSIS.PDF>

The lemma is from page 327 in the link. I am not sure about the dimensions . I believe that **X** is a vector. 

I need a proof for this lemma 5.3.8. And in addition to the proof I need you to define

1: What is **E**(x)

2: what does the notation $\left(d\_{x\_{0}}f\right)\left(X-X\_{0}\right)$ mean. I have never seen the notation $\left(d\_{x\_{0}}f\right)$?

3: Please define the dimensions of f and **X** in the proof.