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EX.2.7.2.a, Sauer3

Use the Taylor expansion to find the linear approximation L(x) to F(x) near x_0 .

(b)
$$\begin{pmatrix} F: \mathbb{R}^2 \to \mathbb{R}^2 \\ \begin{pmatrix} u \\ v \end{pmatrix} \mapsto \begin{pmatrix} 1 + e^{u+2v} \\ \sin(u+v) \end{pmatrix} \end{pmatrix}$$
 at $x_0 = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$