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MATB42: Assignment #10   Apr 3rd 2018

1. Let $\boldsymbol{F}$ be a vector field on $\mathbb{R}^3$ given by $\boldsymbol{F} = (F_1, F_2, F_3)$ where F_1, F_2, and F_3 are C^1-functions from $\mathbb{R}^3 \to \mathbb{R}$

   (a) Let η be the 2-form given by

   $$\eta = F_3 \, dx \, dy + F_1 \, dy \, dz + F_2 \, dz \, dx$$

   Show that $d\eta = (\operatorname{div} \boldsymbol{F}) \, dx \, dy \, dz$
   (page 489, #6)

   $\eta = F_3 \, dx \, dy + F_1 \, dy \, dz + F_2 \, dz \, dx d\eta \qquad = d(F_3 \, dx \, dy + F_1 \, dy \, dz + F_2 \, dz \, dx)$