

MATB42: Assignment #10

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

- (a) Let η be the 2-form given by

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

Show that $d\eta = (\operatorname{div} \mathbf{F}) dx dy dz$

(page 489, #6)

$$\begin{aligned}\eta &= F_3 dx dy + F_1 dy dz + F_2 dz dx \\ d\eta &= d(F_3 dx dy + F_1 dy dz + F_2 dz dx)\end{aligned}$$